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COMMUNICATIONS

CHOROIDAL SARCOMA TREATED BY THE INTRA-OCULAR INSERTION OF RADON SEEDS

BY

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LONDON

THE following is a case of melanotic sarcoma of the choroid which has been treated by means of radon seeds inserted intra-ocularly, and is now reported after twelve months have elapsed.

I want particularly to express my thanks to Mr. Duke-Elder who, knowing of my interest in such cases, was good enough to transfer the patient to my care, and has been so good as to examine him with me again on February 18, 1930, *i.e.*, precisely a year after the institution of treatment.

I shall be asked why I carried out treatment of so experimental a nature when the removal of such an eye would generally be believed to hold out the best prospect of cure, and the reply is that the right was an old blind eye and the patient refused to have the left, the only seeing eye, removed.

The patient, A. I., was a man aged 65 years, admitted to St. Bartholomew's Hospital under my care on February 8, 1929. He was emphysematous. His blood pressure was 185/105. The urine contained neither albumen, sugar, nor melanin. He had recently noticed a pigmented mole on the right nipple.

He had suffered from chronic blepharitis of the left eye for several years. The right eye was convergent, and was the subject of a large dense leucoma adherens; with it he could just see hand movements.

Three weeks previously he had attended Moorfields under the care of Mr. Duke-Elder who diagnosed choroidal sarcoma. The sight had failed for the last six months and had deteriorated more rapidly in the last three weeks.

On examination there was a large, very dark globular mass in the lower part of the globe. (Plate I.) As seen with the ophthalmoscope it invaded the dilated pupillary aperture to the extent shown in Fig. 1. The vitreous was muddy. There were no keratic precipitates and no evidence of iritis was present. The acuity was 6/60 and the visual field was reduced. (Chart 1.)

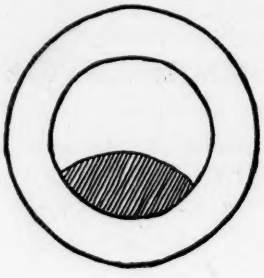

FIG. 1.

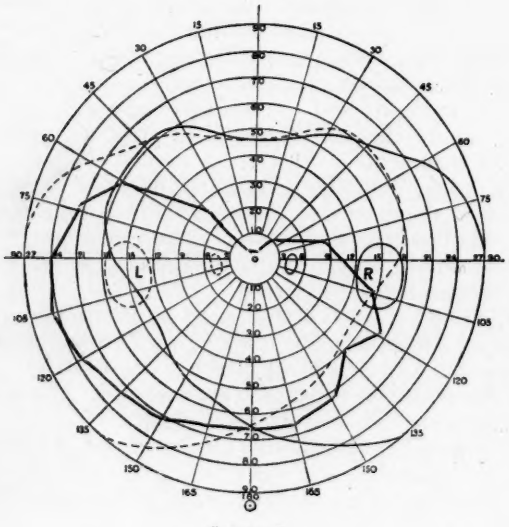

CHART 1.

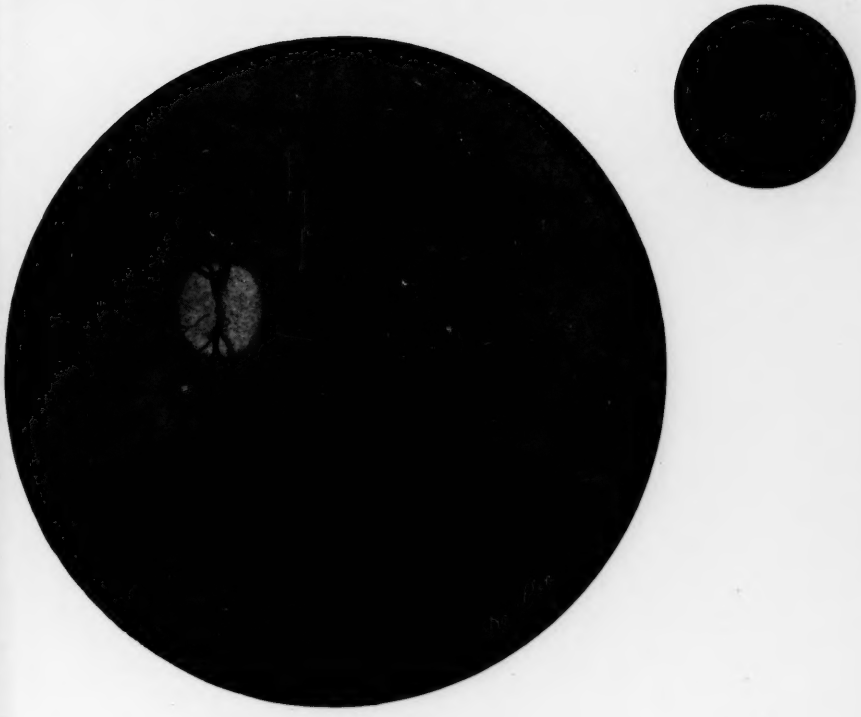

PLATE I.

PLATE II.

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The tumour was completely opaque to transillumination, the lower part of the iris was pushed a little forward, the tension was normal.

In order to be as sure as possible of any changes that might occur as time went by, it was clearly important that as precise observations as possible should be made before instituting treatment and should be continued afterwards. I therefore got Messrs. Hamblin to send a draughtsman to make a drawing of the intra-ocular appearances the day before operating. (Plate I.) At the same time I made as accurate a diagram as I was able, to indicate the position

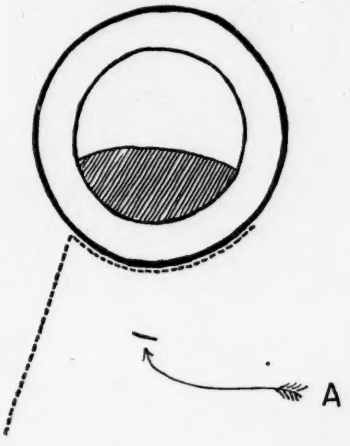

FIG. 2.

of the tumour with regard to the edge of the dilated pupil (Fig. 1) (in Fig. 2 is represented Mr. Milner's estimate of the same point) and got Mr. Milner and Mr. Stallard to make similar observations, and these have been continued at intervals of never more than a month ever since.

Professor F. L. Hopwood, who is in charge of the Radon Department of the Hospital, was good enough to prepare the seed. It was of 1 millicurie strength and was filtered through 0·5 mm. of platinum.

On February 15, 1929, under general anaesthesia the first seed was inserted. I had the advantage of the assistance of Mr. Milner and Mr. Stallard. The conjunctiva was incised by means of a Beer's knife along the lines indicated in Fig. 2 and the flap so outlined was reflected so as to expose the sclerotic.

My endeavour was to insert the seed directly into the thickest

part of the growth so that if possible it would be completely embedded in it. For the incision of the sclerotic I chose a knife of such a breadth as I judged would make a hole just large enough and no larger than was sufficient to admit the seed and for this reason I purposely avoided the use of any form of introducer. The flap of conjunctiva was dissected cleanly off the sclerotic and the knife was pushed straight into the globe at the point A (Fig. 2) with a slight backward slope.

Bleeding was moderate but soon stopped. The seed was taken in a pair of finely ribbed forceps and inserted straight into the growth along what was judged to be the track of the knife. Its hindmost end was pushed just within the sclerotic, and the attached silk, black in colour so as to facilitate the finding of it at a later date, was cut to the length of about an inch, and the conjunctival flap replaced in position.

The inside of the eye was now re-examined with the ophthalmoscope and no alteration of any kind was discoverable. There was no intra-ocular haemorrhage, the seed did not show outside the growth and the growth itself was not altered in appearance.

As will be seen in Plate I a star-shaped opacity was present in the posterior part of the lens. It is a point of passing interest to note that this completely disappeared under the influence of the radium, but what seemed to be a fresh opacity of rather greater density was later developed in the posterior cortex.

Blepharitis of long-standing was present and consequently there was and has been ever since a rather considerable degree of conjunctival discharge, but in spite of this no intra-ocular infection occurred. A small eschar-like area was developed in the conjunctival flap and this appearance has remained ever since but there has been no other change; one feared at first lest there should be sloughing of the sclerotic where it was nearest to the seed but this did not occur nor has it occurred in any subsequent case where seeds of greater strength have been used.

On the morning following the operation the patient complained of a headache which was relieved by aspirin and in the following days complained repeatedly of periodic shooting pains. These were described as lasting a few seconds and came on at intervals of one to several hours. On February 20 the note was:—" There is some bruising over the site of the scleral puncture, no ophthalmoscopic change is visible, still sticky discharge. Last night patient had several attacks of shooting pain in the eye lasting for a few seconds. One attack was followed by a ' knocking ' pain described as like a hammer. It was situated just above the eye and lasted for about five minutes. The eye often waters a good deal after the shooting pain."

The condition underwent no substantial change but a duller and

more continuous pain occurred and as a posterior synechia formed it was probably of iridic origin. It may be said that from first to last there has been no pain that could in any way be called severe. No change could be observed with the ophthalmoscope, but on February 26 for the first time an area of " slate-coloured " staining was noted over the site of insertion of the seed.

A skiagram (Plate II) was taken at this date which shows the seed *in situ*.

On March 1, *i.e.*, fourteen days after the insertion of the seed it was removed under general anaesthesia. The original conjunctival flap was turned backwards, the attached black silk was easily identified among the tissues and by its aid the seed was removed without difficulty.

Apart from the recurring pain which was probably due to iritis no important change was noticed. The tension remained the same, the cornea remained clear and bright, there were no keratic precipitates and no certain alteration could be observed in the tumour. He was discharged from Hospital on March 20, 1929. The urine was examined for melanin by Dr. G. A. Harrison and both the ferric chloride test and the Thormählen reaction were negative, and these same tests again gave a negative result on October 29, 1929.

It had been noticed whilst he was in Hospital that there was a dull brownish colour under the conjunctiva in the region of the scleral incision. I had taken this to be due to the dye coming out of the black silk which was attached to the seed, though the colour looked too brownish. When he next attended at out patients I examined this area with the slit-lamp and by its aid it could be seen that the colouration was produced by little colonies or collections of pigmented cells which were tracking, as it were, from the region of the incision in the sclerotic; whether they had simply escaped from within the eye at the time of insertion of the seed, as I suspect, or whether they had grown out afterwards, I do not know. They, however, completely disappeared in the course of a few weeks, presumably as a result of the effects of the seed, and did not appear again.

The patient was readmitted to the ward on May 13 with the view of considering the advisability of inserting another seed. He had no pain, the blood pressure was 220/120, there was no loss of weight. As it was thought the tumour was a little reduced in size nothing further was done and he left the hospital eight days later.

He again attended regularly as an out patient until June 6. At this date the growth was still easily visible and it seemed advisable to insert another seed.

On June 11, therefore, another seed was inserted by precisely the same technique as had been used for the first one but it seemed wise to use a greater strength. Professor Hopwood therefore

prepared one of a strength of 5 millicuries with 0·5 mm. platinum filter and an endeavour was made to insert it at the same spot and in the same way as on the previous occasion.

On examining ophthalmoscopically immediately afterwards as on the previous occasion there was no intra-ocular bleeding, the seed did not show outside the growth and it was clearly completely buried within the tumour.

On June 21, *i.e.*, ten days afterwards, the conjunctival flap was again turned back and the seed removed easily and the flap replaced, and except that there was a good deal of conjunctival injection it healed well and again no intra-ocular disturbance resulted from the removal of the seed.

On September 3 it was noted that the star-shaped lens opacity was no longer seen, the visual acuity was 3/60, the site of insertion of the radium looked nearly normal except for the whitish eschar-like area in the overlying conjunctiva, and by now it was clear to all of us that the growth was shrinking and this has continued gradually up to the present time. The vision has deteriorated somewhat and for this I believe the developing lenticular opacity previously mentioned was entirely responsible.

At this date the visual acuity was 3/60 as previously. Since this time he has been under monthly observation by Mr. Milner and Mr. Stallard as well as myself, and has been seen by a number of other observers. Except for the blepharitis, which remains troublesome, his eye has given him no bother, he has had no pain in it, there has been no extra-ocular growth in spite of the pigmented cells previously referred to.

Mr. Duke-Elder was good enough to see him with me on February 18, 1930. He had seen nothing of him since January 18, 1929.

The growth, which at first was slow to undergo change, so that for some months we were not prepared to be positive that it was smaller, has now, February 18, 1930, become shrunken to such a degree that it is seen with difficulty and then only by looking right downwards behind the iris. It has lost its tense globular shape, and appears shrunken and of an irregular surface. It is of a dull ashen grey colour instead of the dense dark colour previously.

The posterior synechia at 6 o'clock remains. There are no keratic precipitates. The red reflex is uniform all over the upper part, the tension is normal, there is a good deal of opacity in the vitreous. The field of vision is certainly not reduced as compared with a year ago, *c.f.*, Charts 1 and 2. For the purpose of this paper I asked Mr. Duke-Elder if he would be good enough to let me have a written statement as to his present observations. He says:—"The remains of the growth are now to be seen only by looking well down behind the iris. The mass is about one quarter of the

previous size of the growth, dull greyish in colour and shrunken in appearance; it seems to me likely that it represents fibrous tissue residue of the former neoplasm. There is no extra-ocular extension. The lenticular opacity, chiefly in the posterior layers of the cortex, prevents a clear view of the rest of the fundus and is largely responsible for the reduced vision."

It seems desirable to make a critical survey of the foregoing experience to see whether this form of treatment has justified itself.

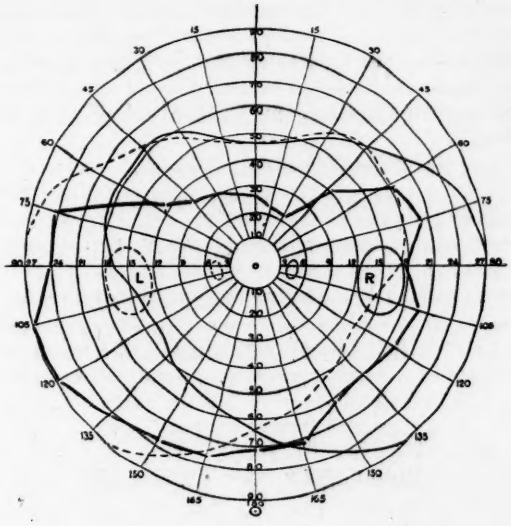

CHART 2.

I think it may be said in the first place that an intra-ocular melanotic sarcoma can be made to shrink greatly and perhaps to disappear by this treatment, and thus the point of paramount importance is with respect to the menace of dissemination; with the commencement of the shrinkage of the growth are we justified in assuming that the danger of dissemination ceases from that time?

It is clear that at present there can be no authoritative reply to this question. We can only judge on general principles and to me it seems unlikely that actively growing cells will be thrown off from a tumour which has begun to regress, and that in fact so soon as the radium has had its effect so soon perhaps does the danger of dissemination cease. If this is so the eye no longer remains as a menace to the subject, and he is in fact as much protected against dissemination (no more and no less), as if he had had the eye removed.

If we are prepared to accept this view it would seem reasonable to treat any case of accessible intra-ocular sarcoma by the foregoing means where the growth has not as yet seriously spoiled the eye, and in the rare cases where the growth occurs in an only eye or in an eye which is the only useful eye it would seem the proper treatment to adopt. It is, however, clearly impossible to make any dogmatic statement at this stage and further experience must be awaited.

The fact that dissemination may already have taken place before the seed was inserted makes it additionally difficult to form a sound judgment. I have known a patient die of dissemination twelve years after the removal of an eye for melanotic sarcoma, and without any local recurrence, and in such a case it seems necessary to suppose that dissemination occurred twelve years before causing death but had remained latent. (*Roy. Lond. Ophthal. Hosp. Reps.*, 1914, XIX, Part III, 421.)

With regard to technique it may be stated that it is not difficult to insert, and afterwards to remove, a radon seed from the substance of some cases at least of intra-ocular melanotic sarcoma without causing intra-ocular haemorrhage or any other complication, and I have since shown in other cases that this can be done even though the tumour is so far back as to be close to the optic disc.

With regard to the strength of seed that should be used it would seem that 1 millicurie is insufficient, that 5 millicuries may safely be used and experience may prove that a greater strength is preferable.

SARCOMA OF THE IRIS

BY

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SARCOMA of the iris is a rare disease. There are about 100 cases on record. The growths may be pigmented or unpigmented. The four cases described below all belong to the former group. Of the pigmented group there are those which definitely start in large pigmented naevi which have been noted to be present beforehand, or those which are supposed to have started in the stroma of the iris. In nearly all the cases the tumour consists of large spindle cells to which the cases recorded below are no exception. These large spindle cells are characteristic of growths derived from naevi and it is probable that most of the tumours which are recorded as having been derived from the stroma of the iris may have had their origin from small naevi of the iris which have not been noted beforehand. Coats (*Trans. Ophthal. Soc. U.K.*, Vol. XXXII,

page 165) collected 26 cases of innocent naevi out of which 7 had become malignant whilst under observation.

The disease is most frequent between the ages of 35 and 55 and according to statistics a little commoner in females than in males, the lower half of the iris being more frequently affected than the upper. It is often difficult to tell whether the tumour starts at the root of the iris or in the neighbourhood of the ligamentum pectinatum of the ciliary body since the latter becomes rapidly involved in the growth (Cases III and IV). They present themselves under varying clinical appearances. If starting in a definite pigmented naevus as in Case 1, the malignancy becomes manifest by increase in the size of the tumour, whereas if starting in the deeper layers of the iris near its root the tumour may spread beneath the stroma of the iris causing discoloration as in Case II. The colour of the tumour when on the surface of the iris may be brown as in Case I, or deep black in colour as in Case III. The tendency of the growth to spread into the fibres of the ligamentum pectinatum and canal of Schlemm gives rise to an early rise of tension in the course of the disease (Cases I, II, and IV), and there is a strong tendency for the disease to spread around the angle of the chamber. This was very marked in Case II, which belongs to the type known as ring sarcoma of the iris, cases of which have been published by Werner (*Trans. Ophthal. Soc. U.K.*, Vol. XXV, p. 266), Parsons (*Arch. f. Ophthal.*, Vol. XXXIII, 1904, p. 101), A. Brun (*Arch. of Ophthal.*, Vol. LIII, p. 162), and T. M. Li (*Amer. Jl. of Ophthal.*, 1923, p. 545). In other cases such as Case III, the angle of the chamber does not become " sown " with malignant pigment cells and the growth may attain a large size without glaucoma supervening.

Case I. Large Pigmented Naevus of the Iris becoming malignant

The Rev. R. first seen by me on September 10, 1915, with a mass on his iris which he had had for some years, but " thinks it has been slightly growing lately." The growth is situated on the outer side and a little below the horizontal meridian. It slightly overlaps the pupil and has a heaped up somewhat convoluted appearance on the surface. There is a little peppered pigment on the surface of the iris between it and the angle of the chamber and there are one or two pigmented spots in the iris tissue elsewhere (see Plate I). The vision of the eye was 6/6. It was watched and as no change took place in the growth nothing was done. Last seen on December 1, 1922.

On May 22, 1928, thirteen years after he was first seen, he was sent up to me by Mr. Maddox; the spongy-looking growth had

increased in size, had blocked the filtration angle and was against the back of the cornea, causing disturbance in Descemet's membrane over a small area. The tension was raised to +1, but the cornea was not steamy. (See Plate II.) The eye was removed.

Pathological Examination.

The tumour involved the whole breadth of the iris in the sector in which it was situated, bulging forwards against the posterior surface of the cornea and backwards protruding through the posterior pigment layer of the iris about its centre. At the angle of the chamber the growth invaded the canal of Schlemm and had extended around for the greater part of its circumference and involved the fibres of the ligamentum pectinatum; it was also beginning to extend backwards into the ciliary body. The growth consisted of large cells of the endothelial type such as are usually found in naevi together with large quantities of pigment cells. The pigment was irregularly scattered throughout the growth either in the form of scattered cells or large masses of pigment. The growth was very vascular and contained large lymphatic spaces. There is no doubt that the tumour was a large pigmented naevus of the iris just becoming malignant and invading the canal of Schlemm and ciliary body. (Figs. 1, 2, 3.)

A somewhat similar case to this has been recorded by E. T. Collins (*Trans. Ophthal. Soc. U.K.*, Vol. XLVI, p. 108).

Case II. Mr. Tudor Thomas's Case
Ring Sarcoma of the Iris

L. E. N., aged 45 years, was sent to me by Mr. Tudor Thomas with a diagnosis of sarcoma of the iris. He complained that his right eye was misty in the earlier part of the day and inclined to water. He thought that his right eye had become darker in colour during the last three months. Vision R. E. with −0·5 D.sph. +1·0 D.cyl. axis vert. = 6/12. L. E. with +1·5 D.sph. = 6/6.

On examination the whole iris had the washed out blue appearance of a long standing irido-cyclitis. The crypts between the iris stroma seemed uniformly dark in colour. There were iritic adhesions in the pupillary area. Down and out there were two raised swellings in the iris with the iris fibres stretched over them, they were slightly darker in colour than the iris and in front of them, towards the pupillary border were three folds in the iris concentric with the pupil. (Plate III.) The tension of the eye was +1. By transillumination, a strong light being used, the swellings appeared to be translucent. As seen later, this was probably due to the fact that the ordinary transilluminating point was used and diffusion of the light took place around the tumour. Taking all

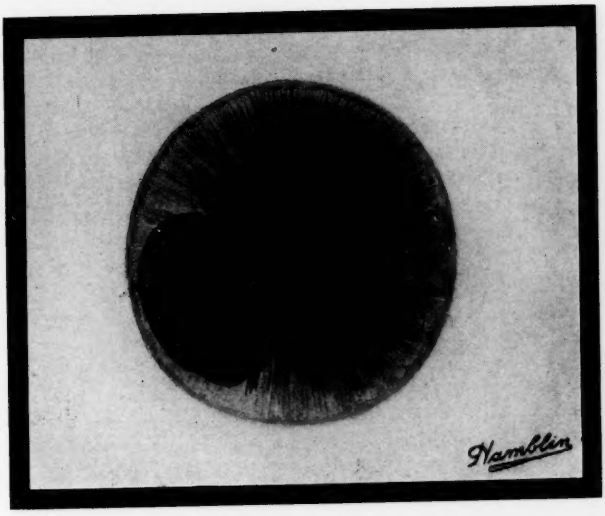

PLATE I. Case I, 13 years before removal.

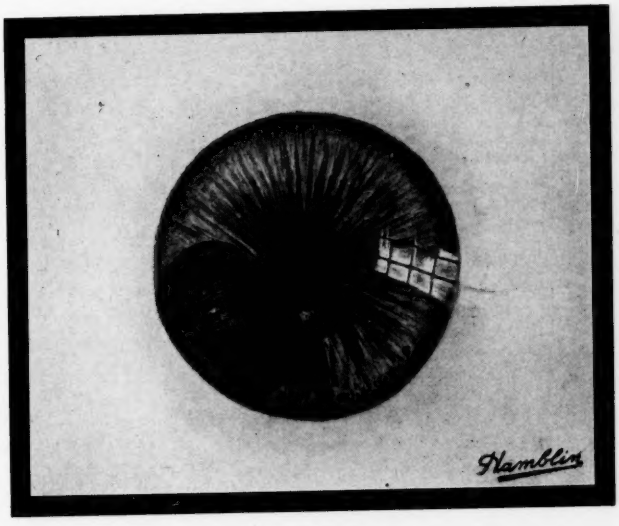

PLATE II. Case I.

PLATE III. Case II.

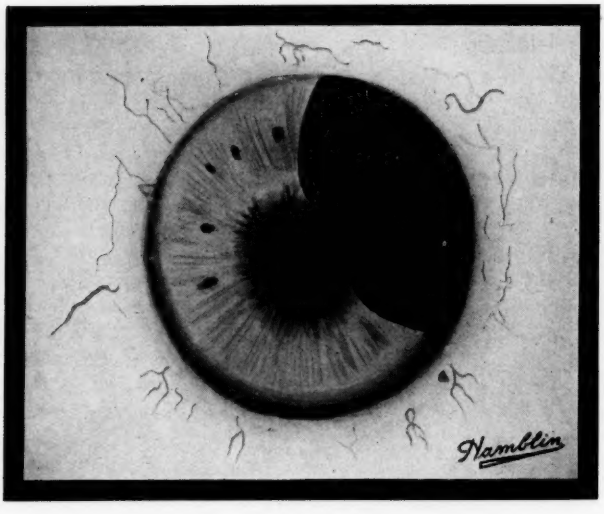

PLATE IV. Case III.

the points into consideration I thought the condition to be a cyst of the pigment epithelium. Having seen bad results from attempts to operate on cysts of the iris, eserine was first used and finally, on August 14, 1927, a trephining was performed at the upper corneo-scleral junction. The tension remained down until November, 1927, when the trephine hole ceased to drain and Mr. Tudor Thomas again trephined the eye and the tension was relieved, the vision remaining as before at 6/12.

On May 2, 1928, the tension again became raised although the filtration had not entirely ceased. The vision was 6/12 and there was some contraction of the field to the nasal side. I saw him for the second time at the beginning of July, 1928. The whole iris had become much more deeply pigmented and the tension was +1. The swelling in the iris did not appear to have increased in size at all. As the trephining evidently did not relieve the tension and the melanosis of the iris had become more marked, I advised removal of the eye, which was performed by Mr. Tudor Thomas. At the time of the removal of the eye, there were one or two pigmented spots on the surface of the conjunctiva above the trephine hole. These were not removed and have not increased in size since the operation.

Pathological Examination.

The eye was divided in an antero-posterior vertical direction. In the upper part of the limbus there was a trephine hole, but the root of the iris was firmly adherent to it and a pigmented mass appeared to block it. There was a peripheral iridectomy a little to one side of the hole. The iris was very dark in colour and there was a circumferential swelling of the iris blocking the angle of the anterior chamber. This swelling was dense black in colour and was solid. The whole anterior part of eye appeared deeply pigmented. There was pigment in the suspensory ligament of the lens, and on the lens capsule at the equator, and there was some indication of pigment in the region of the canal of Schlemm. There was a small patch of old anterior choroiditis, and the disc was deeply cupped. Half the eye was embedded in celloidin and sections made in the ordinary way. During the preparation the lens fell out of the specimen. The sections showed a darkly pigmented growth mainly situated in the lower angle of the anterior chamber and extending around its periphery in a ring-like manner. It apparently arose from the root of the iris and had spread back slightly in the ciliary body and had also involved the canal of Schlemm, spreading round the angle of the anterior chamber to the greater part of its circumference. The ciliary processes were somewhat flattened over the surface of the growth. The growth extended forward into the

iris. Near the root of the iris it formed a small nodular mass, but over the surface of the iris it had spread superficially not involving the deep layers, but was seen by the naked eye to be deep to the superficial layers of the stroma of the iris and this no doubt accounted for the discoloration of the iris as seen clinically. Pigmentation had spread into the trephine hole and had blocked it and no doubt caused the rise in tension after the first trephining. Bleached sections showed that the tumour consisted of a large spindle cell growth of an endothelial type. Nearly all the cells of the tumour contained pigment. These large cells seem characteristic of sarcoma of the iris whether they have grown from a naevus which has previously been observed or not, and it is probable that this may have been the origin of the tumour. (Figs. 4, 5, 6, 7.)

In the following cases III and IV, it is doubtful whether the tumour started in the iris or ciliary body but the balance of evidence is in favour of the former.

Case III

C. D., aged 48 years. For 12 months she had noticed a spot on her right eye at the upper and inner side of the iris and during the last three months her vision had failed. On examination there was a black tumour situated at the upper and inner side of the iris and occupying about a third of its circumference. The tumour reached almost to the pupillary margin and bulged forward against the back of the cornea causing a disturbance in Descemet's membrane. No tumour could be seen behind the iris through the pupil. Tension, +1. Vision, fingers. (Plate IV.)

The patient was admitted to the Central London Ophthalmic Hospital on October 28, 1928, and the eye was removed. The patient made an uninterrupted recovery. The eye was fixed in Zenker and bi-sected through the growth. A large growth was found occupying nearly the whole breadth of the iris and the anterior part of the ciliary body. It had destroyed the iris except near the pupillary margin and the anterior part of the ciliary body. It had invaded the canal of Schlemm and the angle of the chamber on either side of the tumour contained pigment cells. The tumour was commencing to cause distortion and displacement of the lens by pressure upon it. The tumour consisted of large endothelial-like cells, both pigmented and unpigmented, similar to those found in pigmented naevi. The anterior part of the tumour towards the pupillary margin showed considerable signs of degeneration and the remains of the iris in that neighbourhood were atrophic. Posteriorly the tumour had caused atrophy in the ciliary processes but the epithelium was still lying over the surface of the tumour.

CASE I.

PIGMENTED NAEVUS OF THE IRIS BECOMING MALIGNANT.

FIG. 1.

The growth has ruptured through the posterior surface of the iris.

FIG. 2.

Showing the involvement of the angle of the anterior chamber. The growth starting to involve the canal of Schlemm and the ciliary body.

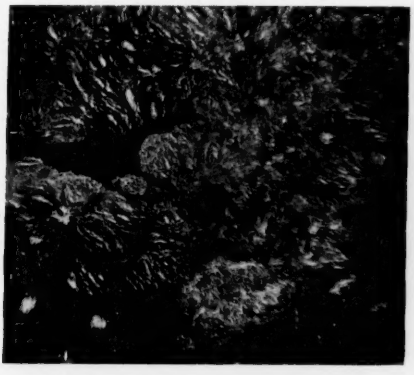

FIG. 3.

Showing the masses of pigment and large spindle cells composing the growth.

CASE II.

RING SARCOMA OF THE IRIS.

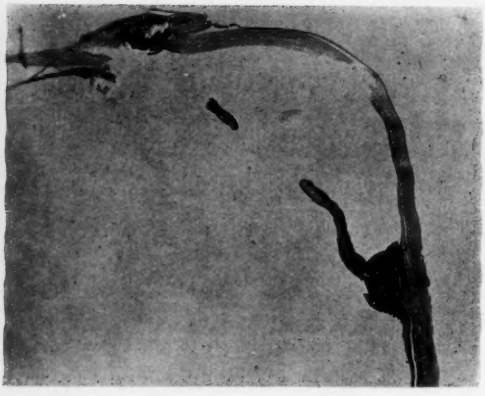

FIG. 4.

The anterior part of the eye showing the growth in the angle of the chamber and pigment blocking the trephine hole.

FIG. 5.

The pigmented growths in the angle of the chamb involving the ciliary body and canal of Schlemm

FIG. 6.

Showing the pigmentation spreading in the superficial layers of the iris.

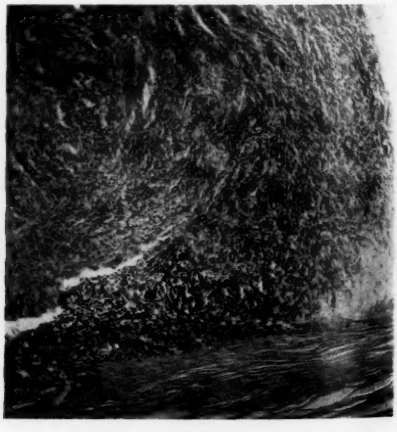

FIG. 7.

The growth composed of large spindle and pigment cells.

CASE III.

MELANOTIC SARCOMA OF THE IRIS

FIG. 8.

...erior part of the eye showing a tumour of the iris ...ch has ruptured through the posterior surface of the ...and involved the ciliary body and suspensory ligament of the lens.

FIG 9.

Showing the pupillary margin of the iris which is atrophic. The tumour in this region has undergone considerable degenerative changes.

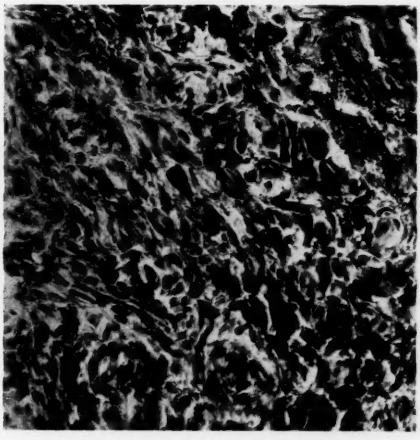

FIG. 10.

Showing the tumour composed of large spindle and pigment cells.

CASE IV.

MELANOTIC SARCOMA OF THE IRIS.

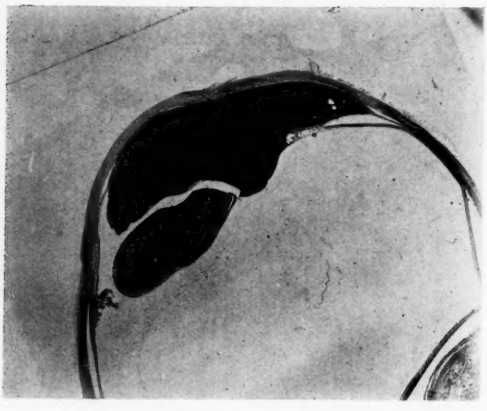

FIG. 11.

Melanotic sarcoma of the iris showing extensive involvement of the ciliary body, retina, suspensory ligament of the lens and deformation of the lens itself.

The remainder of the iris showed no excess of pigment. (Figs. 8, 9, 10.)

Case IV. Mr. Bride's Case

T. H., aged 44 years. Attended the Manchester Royal Eye Hospital on January 30, 1928. He said that three months previously he had injured his right eye with a flash from an electric welder, after which he noticed a dimness of vision. Right eye: no sign of injury. A large brown nodular mass was present in the anterior chamber at the nasal side. Transillumination showed this to be completely opaque. Vision 6/12. Tension normal. Left eye normal except for 3·5 dioptres of hypermetropia. Right eye was removed at the beginning of February with a long piece of optic nerve. The patient made an uninterrupted recovery. He had been examined by Dr. Donald Core, who could find no evidence of any secondary growths, and has remained well up to the present time.

The eye was bisected through the growth. The tumour was seen to occupy the whole breadth of the iris and ciliary body and was spreading backwards into the choroid. The pressure of the tumour had caused deformation of the lens and displacement away from the tumour, the fibres of the suspensory ligament were evidently relaxed and the lens had assumed a more spherical shape on the opposite side to the tumour. The iris was against the back of the cornea, but in spite of the angle being occluded, the clinical notes said that there was no increase of tension. The tumour consisted of large endothelial cells and contained a considerable amount of pigment. The ciliary body was completely atrophied and the tumour was actually invading the retina in the region of the ora serrata, the retina being oedematous and cystic as the tumour began to involve it. (Fig. 11.)

Conclusions

The above cases I think show the various stages of the disease and its mode of involving the surrounding structures. The early involvement of the canal of Schlemm leading to increase in tension is of great importance from a diagnostic point of view since it may be the only means of distinguishing an innocent from a malignant tumour. According to some authorities the loss of mobility of the iris is an important factor in diagnosis, but this I was not able to verify. Although the cases present varying clinical aspects, the histological changes so far as the cytoplasm of the cells is concerned are similar, which fact suggests that most of them have their origin in naevi.

LEUCO-SARCOMA OF THE IRIS

BY

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PRIMARY sarcoma of the iris is a relatively rare condition; and although there may be little fundamental pathological difference between those tumours which contain pigment and those which do not, the greater rarity of the leuco-type of sarcoma makes the occurrence of such cases more interesting. Notes of the following case may therefore be of value.

CLINICAL HISTORY.

The patient, a man aged 60 years, presented himself at the out-patient department at St. George's Hospital complaining of visual failure which had been progressive over some months, affecting especially the left eye. The left lens showed advanced peripheral opacities of the senile type, apart from which the eye was normal. The right eye, however, showed a raised circular tumour about 3 mm. in diameter situated at 9 o'clock on the middle of the anterior surface of the iris (Fig. 1). The iris itself was of a bluish-orange type, and the tumour was of a yellowish-white colour, richly vascularized, and showing on its surface numerous vascular loops. That it had to some extent infiltrated the surrounding tissues was suggested by the fact that the circular outline of the pupil was flattened in this region, and on dilatation of the pupil this section of the iris failed to respond satisfactorily as elsewhere. There was evidence of senile cataract in the lens, less advanced than in the other eye, but the segment opposite the neoplasm showed the most pronounced opacities.

Excision of the eye being refused by the patient, local removal of the neoplasm was attempted in the first place. Under regional anaesthesia a conjunctival flap was dissected up towards the limbus in the region opposite the tumour and a keratome incision at 11 o'clock was carried round the limbus to 7 o'clock with scissors, whereupon the cornea was partially reflected with the conjunctival flap. A large segment of the iris including the neoplasm was then excised, and the conjunctival flap replaced. When the nature of the tumour had been verified by pathological examination, and in consideration of the fact that infiltration was noted in the surrounding tissues of the iris, the eye was removed some days later. Serial sections of the globe showed no other pathological lesion. The eye was excised fourteen months ago, and the patient is still well.

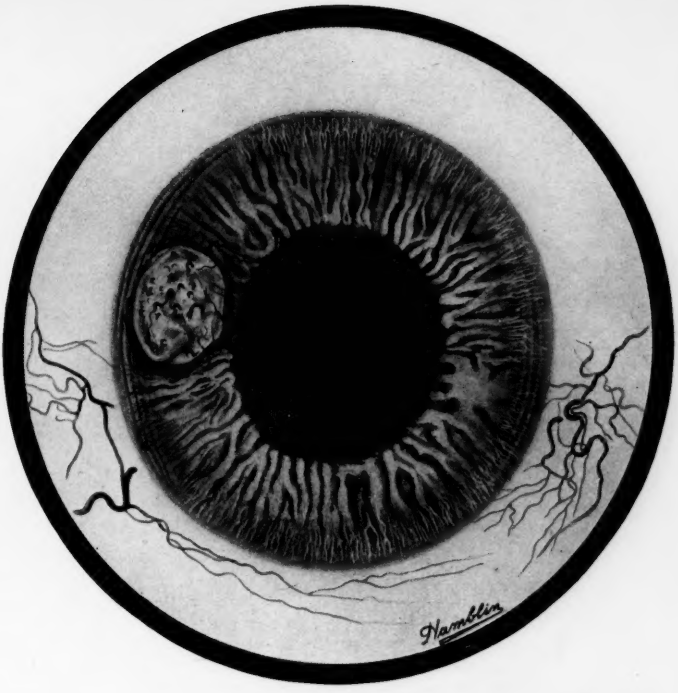

FIG. 1.

FIG. 2.

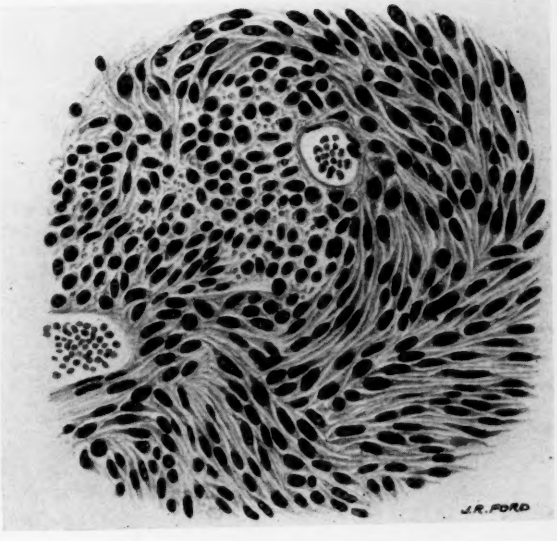

FIG. 3.

PATHOLOGICAL FINDINGS. (Figs. 2 and 3).

The neoplasm was composed of spindle-shaped cells with elongated oval nuclei. The arrangement of the cells was for the most part irregular, but in places they were disposed in interlacing bundles. The entire mass was very cellular and there was no intercellular connective tissue. There was also an absence of mitotic figures. There were many widely dilated blood channels with walls composed of a single layer of endothelial cells resembling embryonic blood vessels. There was no capsule surrounding the neoplasm and it infiltrated the neighbouring iris stroma for some distance. There was no trace of pigment throughout the entire mass, but at the periphery the normal iris stroma was provided with chromatophores.

A search into the literature has revealed only twenty-five cases of this condition reported up to date. An analysis of these cases, together with the one described above, in all twenty-six cases, shows the following facts:—

(i) *Sex.* 14 males and 12 females.

(ii) *Age.*

1 to 10 years	...	...	2 patients.
10 to 20 years	...	...	4 patients.
20 to 30 years	...	...	4 patients.
30 to 40 years	...	...	3 patients.
40 to 50 years	...	...	3 patients.
50 to 60 years	...	...	6 patients.
60 to 70 years	...	...	3 patients.
70 to 80 years	...	...	1 patient.

The youngest case was a child aged one year, reported by Narog, and the oldest a man aged 75 years.

(iii) *History.*—The duration of the symptoms and signs which caused the patients to seek advice varied from three weeks to twenty years. Some patients had observed a pigmented spot on the iris for many years. One complained of pain in the affected eye; in five the visual acuity was diminished, and one was blind. Charnley has reported a case of leuco-sarcoma of the iris where the patient sought advice on account of recurrent attacks of hyphaema. Three patients gave a history of injury, and in three others the affected eye had been inflamed at some previous date.

(iv) *Site of the Tumour.*

Lower half of the iris	7 cases.
Temporal half of the iris	1 case.
Nasal half of the iris	3 cases.
Upper nasal quadrant	3 cases.
Lower nasal quadrant	4 cases.
Lower temporal quadrant ...	8 cases.

(v) *Shape.*

Nodular	6
Triangular	1
Diffuse	1
Globular	2
Pedunculated	1

(vi) Obvious *vascularity* was remarked upon in 6 cases.

(vii) *Microscopic appearances.*—Nine specimens were described as consisting of spindle cells, 3 of round cells, and 6 of round and spindle cells mixed together. Of the remainder no definite account of the cytology is given.

The points commented upon were the absence of pigment, of mitotic figures, intercellular tissue, inflammatory reaction and of degenerative changes.

(viii) *Complications.*—Glaucoma supervened in two cases, while pressure on the lens produced opacities in two further cases. Six cases showed infiltration of the neighbouring structures: in one case infiltration extended into the angle of the anterior chamber; in a second it involved the canal of Schlemm as well; in a third it had extended inwards to the ciliary body; in a fourth the sclerotic was involved; in a fifth the cornea; while in the sixth the cornea and the angle of the iris and the ciliary body were involved in the spread of the neoplasm.

(ix) *Treatment.*—The results of these recorded cases would seem to indicate that if the tumour is localized in the iris in such a manner that its removal by iridectomy can be complete, this localized method of treatment is permissible. Where this has been done no recurrence has been noted for periods up to twelve or eighteen months after the operation, but where the removal is incomplete, the trauma serves as a stimulus for a more rapid growth of the tumour. It would seem that the indications for iridectomy may be stated thus: where the neoplasm is small, well defined, situated at or

near the pupillary margin of the iris, and is not encroaching on the ciliary border of this tissue; where the intra-ocular tension is normal, the vision of the affected eye is good, and where iridectomy provides facilities for complete removal, a circumstance which can be verified subsequently on pathological examination of the excised portion of the iris. It is obvious that such a method of treatment involves a continuous supervision of the patient afterwards. Where these conditions do not prevail the eye should be excised; a course which is probably the safer in all cases. The prognosis after excision appears to be relatively good provided that the neoplasm does not extend along the perivascular sheaths of the ciliary vessels.

Gifford treated a patient suffering from leuco-sarcoma of the iris by the application of 32 to 48 milligrammes of radium bromide for twenty-five minutes daily for ten days. The radium tube was applied to the outer side of the closed lids in all the treatments except two, when it was held directly across the cornea by sub-conjunctival sutures for one minute. The neoplasm diminished in size, but the patient insisted on the eye being excised on account of the pain and irritation involved by this method of treatment.

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THREE CASES OF TRAUMATIC PULSATING EXOPHTHALMOS*

BY

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CLINICAL cases often occur in series. Between July, 1928, and September, 1929, we had the opportunity of examining, at the ophthalmological clinics at Iassy, three cases of pulsating exophthalmos, all of traumatic nature; one of them due to lesions occasioned by a bullet located intracranially, as shown by X-rays; one to fracture of the base of the skull and one to *contre-coup*.

Case 1

T. G., male, aged 14 years, a war orphan from the city of Vaslui, entered the ophthalmological clinics of Iassy on July 12, 1928, with proptosis of the left eye and various nervous disturbances.

The history of the condition was as follows: On May 21, 1928, he was accidentally shot by a revolver in the lower left eyelid. He was taken to the hospital at Vaslui in a comatose state. A week later he was transferred to the surgical section of the Hospital St. Spiridon at Iassy. A radiograph of the skull showed the bullet in the occipital region. Two weeks after the injury the oedema of the right eye lessened; the boy began to move this eye and to recognise surrounding objects. According to the statement of his mother the injured eye had always been exophthalmic before the accident. With return of consciousness the boy complained of hearing a mill-like noise in his head. Professor Elena Puscariu diagnosed the case as pulsating exophthalmos due to arterio-venous aneurysm.

Examination of the general condition showed the boy to be well developed. There was almost complete deafness, with right facial palsy and paralysis of the left third cranial nerve, superficial sensibility was disturbed and both knee-jerks were exaggerated; ataxia was present with athetoid movements in the left arm. Babinsky's sign was present in the right foot. The mental condition was peculiar, the boy laughing without reason; the abdominal and cremasteric reflexes were exaggerated, there was no disturbance of the sphincters. The right eye was found to be normal.

Examination of the left eye showed the upper eyelid to be violet coloured with intense collateral circulation; the globe was proptosed almost out of the socket and was motionless; chemosis

*Cases 1 and 2 were shown at a meeting of the Medical Society of Iassy in 1929.

present in the lower half; the cornea, being partly covered by the swollen conjunctiva, showed infiltrations and dilated vessels, but did not stain with fluorescein. (Fig. 1.)

The lower lid was much swollen and showed in its middle third the scar of the bullet wound. The bones of the orbit appeared uninjured. Vision in the right eye was normal, the left eye was blind. The tension of the right eye was 21 mm., that of the left, 27 mm. The exophthalmos measured 14 mm. in the right eye and

FIG. 1.

30 mm. in the left. Pulsation was well marked in the upper-inner angle of the orbit, and could be felt as an almost continuous quivering. A loud bruit could be heard at the left temple synchronous with the cardiac systole and sounding like the gush of steam from an engine; compression of the left carotid entirely stopped this noise.

On July 17, 1928, an attempt was made to sew the lids together and to ligature the ophthalmic vein, but had to be given up on account of severe haemorrhage, which could only be controlled by leaving a forceps in position for three days. The boy was discharged complaining of retro-orbital pain.

On November 10, 1928, he returned to the clinic. The exophthalmos now measured 33 mm. Pulsation, thrill and bruit as before, the bruit being stopped by compression of the left carotid. The cornea was opaque and ulcerated; hearing had returned almost to normal in the right ear. The bruit could be heard as far back as the occiput with its point of maximum intensity in the temple.

Neurological examination showed the left eyebrow and labial

commissure to be raised, movements of the right face reduced. Movements of adduction, abduction and extension of the fingers of the right hand abolished; movements of the sole of the right foot absent; flexion at the right hip reduced. The boy had to have support when walking and stepped on the outer side of the foot and tips of the toes.

There was remarkable hypotonicity of the right foot flexor muscles; the popliteal cavity had disappeared, the leg making on the thigh an angle opening forwards contrary to the normal. The eyeball was motionless, its sensibility very much reduced, that of the cornea practically absent. The knee-jerks were exaggerated, especially the right. Clonus was present in the right foot and Babinsky's sign as at first. The boy's mental condition was still peculiar, he laughed without reason. The bullet must have produced an injury to the pyramidal tract causing a right hemiplegia; probably caused a direct injury of the optic nerve and the third cranial nerve, the trigeminal and the Gasserian ganglion. Further treatment in this case was refused and the boy left hospital.

Case 2

C. V., male, aged 34 years, a railway worker in Ocnitza, Basarabia, attended the medical station of the railway on March 23, 1929, with right-sided pulsating exophthalmos. In November, 1927, he had suffered a head injury from some planks while he was uncoupling two waggons. He was picked up unconscious and taken to hospital. On the way he came to his senses and found that he was bleeding from the nose and ear. In this state he was admitted to the surgical clinic; next day he presented left facial palsy and convergent strabismus of the left eye, with consequent diplopia and intense headache. The headache gradually diminished, but from the start he had diminished hearing on the right side, and complained of a windy noise in the head which annoyed him day and night. Lumbar puncture was performed on admission and an ice bag placed upon the head.

He left the clinic on December 18, 1927, showing facial palsy and left external rectus paralysis, with slight diminution of the right palpebro-ocular sulcus. In March, 1928, he was admitted to the medical clinic for massage and electrical treatment, which cleared up the facial palsy and diplopia. He went back to work in April, 1928, though still troubled by the noise in his head. After a month on duty the patient found the noise insupportable and at this time the exophthalmos appeared on the right side; this increased rapidly and was made worse by coughing, sneezing and lowering of the head. The measurements were (Hertel) right eye, 21 mm., left eye, 11 mm. Right eyeball proptosed and lids slightly swollen. (Fig. 2.)

The swelling passed over the end of the eyebrow and involved the temple. The right palpebro-ocular sulcus was replaced by a swelling which was most marked at the upper-inner angle; the inferior sulcus was slightly diminished, the palpebral aperture slightly stretched and reduced in height. Dilated, sinuous veins

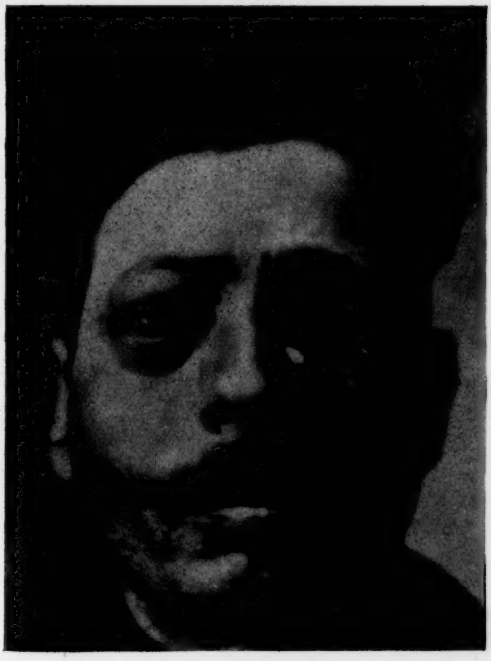

FIG. 2.

were to be felt at the upper-inner angle of the orbit; the swelling pulsated synchronously with the radial pulse and a thrill could be felt. On retracting the eyelids the conjunctiva appeared congested and covered with dilated vessels. The right cornea was clear, but the corneal reflex was diminished; the pupil was irregular, synechiae being present. The pupil diameter was 3 mm. on each side and the reactions were normal.

The visual acuity was R., 0·7; L., 1. The tension was R., 20 mm., L., 18 mm. (Schiötz). The left visual field was normal while that on the right side was diminished between 30 and 50 degrees. Examination of the fundus showed a blurred right disc with distended veins and arteries scarcely perceptible. The left

fundus was normal. Retinal tension (Bailliart), 30 mm. and 70 mm. The ocular movements were normal, there was no diplopia and no anaesthesia. A marked bruit was heard with maximum intensity at the inner canthus, but propagated to the temple. Lowering the head accentuated the exophthalmos. Rest in bed led to a slight diminution in the exophthalmos, and digital compression of the right carotid led to a cessation of the noise in the head and the patient went home with instructions as to the com-

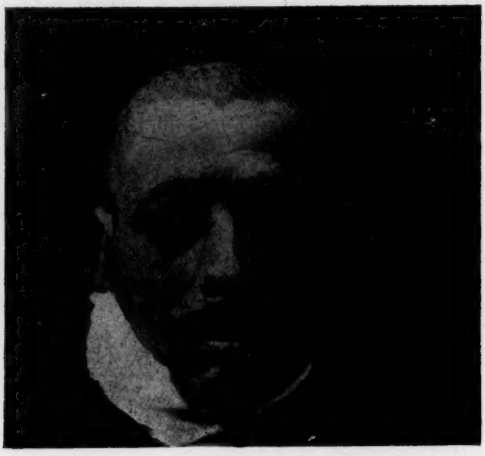

FIG. 3.

pression of his carotid. The general condition was normal; heart, normal; blood-pressure (Pachon), 12·5 and 5·5. Hearing was diminished on the right side from injury to the ear. The Wassermann reaction in the blood and cerebro-spinal fluid was strongly positive. Urine, normal, blood urea, 0·41.

On April 11, 1929, the right internal carotid was ligatured under local anaesthesia with novocaine, adrenalin and morphine, subcutaneously by Professor Tanasescu. The wound healed by first intention, the bruit completely disappeared; the exophthalmos measured 19 mm. and the tension 17 mm. A fortnight after operation the exophthalmos measured 16 mm in the right eye and 11 mm. in the left; the vision was normal in each eye, with the field diminution as on the previous examination. (Fig. 3.)

On leaving hospital the veins in the upper-inner angle of the right orbit could no longer be felt, the vascularity was much diminished. A final examination on September 8, 1929, showed normal acuity of vision in each eye; exophthalmos, R. 13 mm.,

FIG. 4.

L. 11 mm.; visual field in the right eye normal; bruit, completely disappeared. Slight anaesthesia of the right face is his sole disability; he is on full work and has no discomfort of any kind. He was advised to continue antiseptic treatment. (Fig. 4.)

Case 3

An electrician, aged 19 years, came to the eye disease clinics at Iassy on August 18, 1929, presenting exophthalmos on the left side. While at work in a building the patient fell on to a cement floor from a height of 4 metres; according to the report of his mates he had fallen on his feet while his head struck the wall of the building. The accident occurred on July 1, 1929. He was picked up unconscious and taken to the surgical section, where he was detained until July 5, with a contusion of the left orbital region and chin. On admission he had epistaxis and blood discharge from the ear; on regaining consciousness he was found to have slightly

diminished hearing on the left side; the left eyelids were swollen and ecchymosed. There was some pain in the left orbit which was treated by cold compresses. He also complained of loss of smell and that the sense of taste was dull on the left side of the tongue. The local swelling quickly cleared up and he was discharged with very slight proptosis. After leaving hospital he had vomiting and bleeding from the left nostril and he came to the eye clinics.

He was well developed, the left superior palpebral sulcus was obliterated; the left eye was exophthalmic, and the bulbar conjunctiva was appreciably injected; the eye movements were not affected and no abnormality could be felt in the bones of the orbit. The right eye was healthy. His visual acuity was: left eye, $\frac{1}{3}$; right eye, 1. Exophthalmos measured, left, 19 mm., right, 14 mm. The tension in the left eye was 20 mm., that in the right, 17 mm. General blood pressure was, maximum 8, minimum 5, measured in the brachials.

The blood Wassermann reaction was negative.

The patient complained of a noise in his head like the gush of steam from an engine from the time that he recovered consciousness; this noise had increased rather than diminished since that date. On auscultation, a bruit was heard all over the left temple with its maximum intensity over the inner end of the eyebrow. On palpation at the inner angle of the orbit a slight pulsation could be felt synchronous with the radial pulse; both pulsation and the noise in the head were controlled by digital compression of the carotid and the man went home to practise compression for himself until such time as he could be admitted for operation.

On September 29, 1929, under general narcosis, he had his left internal carotid tied by Professor Hortolomei. The wound healed by first intention and the after course was uneventful except for some vomiting and slight agitation. Four days after the operation a slight right hemiparesis was noted with right facial palsy, the knee-jerk on the right side was exaggerated, there was no anaesthesia, but all movements, including the opposition of the thumb (Babinsky) were executed with difficulty. The noise in the head was noted twice for a few moments and then disappeared completely; the conjunctival injection cleared up immediately and a fortnight after the operation the exophthalmos measured 15 mm. in the left eye and 14 mm. in the right; the hemiparesis persisted for more than a month.

The visual acuity showed no improvement and there was slight contraction of the field in an upward direction. Hearing remained diminished in the right ear. The man was transferred to the neurological clinic for treatment of the hemiparesis. It should be mentioned that he was an old case of trachoma with much scarring of the conjunctiva.

In these cases the exophthalmos appeared immediately after the trauma in the first and third cases and after twenty days in the second. Poullard, Boussi and Prosper Vail record a case in which this sign appeared two months after the injury. In our first two cases the pulsation was very obvious to the finger while in the last case it was hardly appreciable except when the man strained. Delore, Aurand and Roland speak of a case of arterio-venous aneurysm in which this sign was completely absent. In most cases this sign can be observed by watching the patient in profile. The pulsations are synchronous with the radial pulse. In each of our cases the ocular tension in the exophthalmic eye was raised. Rochon-Duvigneaud and Varere consider that these rises of tension may almost reach the level of glaucoma. Bailliart has shown that venous pressure is raised in these cases of pulsating exophthalmos while arterial pressure is lowered. In some cases there is remarkable hypertension in the central artery of the retina. When the carotid is torn in the cavernous sinus there is no difference between the minimum and the venous pressure on the exophthalmic side. All patients notice and complain bitterly of the noise in the head. Very occasionally the noise can be heard at a distance without need of auscultation; its maximum intensity is usually in the temple, it is synchronous with the pulse and it is sometimes accentuated by efforts such as stooping and straining. Le Fort thinks that the bruit is intermittent in arterial aneurysm. Local vascular engorgement is usually well marked and neuro-paralytic keratitis may occur from damage to the ciliary nerves or ganglion; in some cases the optic nerve is damaged and the eye may be blind. Le Fort gives 44 cases of pulsating exophthalmos with loss of sight, out of 53 cases; in such cases ligature of the carotid usually does not lead to any improvement in visual acuity.

In 41 autopsies, Cauchoix found in 15 cases arterio-venous aneurysm without an actual tear in the arterial wall, in two cases a circumscribed aneurysm of the ophthalmic artery and in six cases dilatation of the sinus was found as well as of the ophthalmic vein. Nida thinks that in these cases of arterial lesion the difference between arterial and venous pressure is nil.

Pulsating exophthalmos may occasionally be due to tumours or atheromatous conditions but the most common cause is injury; either head injury or local orbital injury from penetrating foreign bodies; in these latter cases the value of an X-ray photograph is apparent. Palliative treatment by injections of lactate of iron has given no good results; at the present time ligature of the common or internal carotid artery gives the best hope of amelioration. Such an operation may be followed by hemiplegia, this being due possibly to sepsis or ischaemia. Le Fort, in 1879, gave a 45 per cent. mortality after this operation. Siegriest in 1900 found a mortality

of 38 per cent. in 71 cases. De Fourmestraux (Thesis, Paris) in 1908 found a mortality of 21 per cent., which diminution he ascribes to improvement in aseptic technique. Preliminary digital compression of the carotid is recommended before operation in order to try and establish sufficient collateral circulation and so diminish the liability to nervous complications. Cerebral accidents occur in 10 per cent. of cases after ligature of the carotid. The percentage of cures after ligature of the internal carotid should be 63 per cent.; in cases where ligature of both carotids was necessary the number of cures diminished to 25 per cent., with a mortality of 15 per cent., which fatality is less likely to occur when some lapse of time has separated the two ligature operations. Some authors such as Woodward, Szimanowski, Lazarew, Bodon, Dollinger, Wiesinger, Perthes, Sattler, Burghard and Pritchard, Gifford and Jones, Golovine and Schwalbach recommend ligature of the superior ophthalmic vein at the inner angle of the orbit, preceded by tarsorrhaphy; of 15 cases so treated 13 were cured (Cauchoix).

The sequelae of ligature of the carotid may be embolism of retinal arteries (Siegrist, Broca), paralytic strabismus (Watson, Ehremann), and psychological disturbance with or without paralysis (de Lapersonne and Sendral).

Mortality in pulsating exophthalmos is given by Le Fort as 4·7 per cent.; as 7 per cent. by Sattler and as 4 per cent. by Keller; ligature cures the exophthalmos in 57 per cent. of cases, and the vision is good so long as the optic nerve has sustained no damage.

Of our three patients the first refused surgical treatment; he will probably get a perforation of his cornea due to neuro-paralytic keratitis and infection, which may lead to death through meningitis, or even to profuse and uncontrollable haemorrhage. The other patients gladly accepted operation, with a satisfactory result in each case. We think that the hemiparesis in the last patient which occurred four days after the operation was probably due to cerebral ischaemia.

Our second patient had the operation performed under local anaesthesia and was very docile during and after the operation: we believe in this form of narcosis for this class of case, as the patient can furnish indications on the effect of the ligature; we have found that the subcutaneous injection of morphine 0·03 ctgr. as an adjuvant to the local anaesthetic is helpful.

We believe that post-operative nervous complications are closely connected with the lapse of time that occurs between the appearance of the exophthalmos and the surgical intervention; the longer this is the better the chance of a collateral circulation being developed. The importance of these complications cannot be overlooked and we must remember that a hemiplegia may occur;

if this happens after ligature of the left carotid there will be a right-sided hemiplegia which will be a severe handicap to the future wage-earning capacity of the individual.

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GLAUCOMA AND GLAUCOSAN DROPS*

BY

DR. CARL HAMBURGER

BERLIN

THE medical treatment of the chronic forms of glaucoma ought to be encouraged, for the results of operations are not always satisfactory: in many cases operations have to be repeated; sometimes they do harm instead of doing good.

Throughout the whole of medical science the curing of chronic diseases (glaucoma simplex, *i.e.*, "Chronic Glaucoma," the main subject of this article) is very difficult and protracted, nor can it easily be done at one stroke by means of operations. Therefore the iridectomy of Albrecht von Graefe has held its ground only with regard to acute glaucoma; it would never have won its triumphant way all over the world if it had first been recommended for *chronic* forms of glaucoma. With regard to these the number of operative methods is exceedingly great and every year adds new ones. This by itself proves their unreliability.

Here are a few examples:

1. A minister, a gentleman who can afford the best doctors, was on the way back to Europe from the Far East. In Lisbon he called upon a prominent oculist who diagnosed glaucoma in one eye: "they will operate on you in your country, my advice is the contrary." The patient came home, underwent an operation; the operated eye became blind. In this case two authorities contradicted each other, and the cautious man was right.

2. A Russian surgeon underwent most successfully an operation on one eye for glaucoma. After a few years the other eye also became affected. The first eye having been operated upon with the best success, much was to be said in favour of operating upon the second. Nevertheless, immediately after the operation a considerable diminution of vision of the second eye took place, not down to the point of blindness, but to loss of binocular vision.

3. A woman was affected by glaucoma in one eye. Visual field very much reduced, but visual acuity still 1/3; thus very useful. The iris prolapsed into the wound; severe, slow inflammation with sympathetic ophthalmitis followed; this eye had to be enucleated; the second, up to that time perfectly well, healed after

* See the papers: "Treatment of Glaucoma," by W. S. Duke-Elder and Frank W. Law (*Brit. Med. Jl.*, March 30, 1929, pp. 590-592). Wright and Nayar: "The adrenaline pack in the treatment of glaucoma," *Brit. Med. Jl.*, September, 1929, pp. 456-457. Gifford: "Some modern preparations used in the treatment of Glaucoma," *Arch. of Ophthal.*, November, 1928, pp. 612-627. Pischel: "Glaucosan in glaucoma," *Amer. Jl. of Ophthal.*, September, 1928, pp. 705-709. N. E. Israel: "Observations on the use of glaucosan," *Texas State Jl. of Med.*, September, 1927.

six months (!) leaving acuity of vision severely damaged. (*Klin. Monatsbl. f. Augenheilk.*, Bd. LXXVI, p. 604).

These three patients were operated on by famous oculists, so that technical mistakes cannot be assumed. It is, therefore, a great error to tell students and doctors, that with regard to operations for chronic forms of glaucoma " good technique guarantees good success."

The non-operative methods, up to now limited to the application of eserine and pilocarpine, have been increased by glaucosan,* *chiefly by its convenient administration in form of drops* (*glaucosan drops, laevo-glaucosan*); they are not effective in all, but in the majority of cases. It is highly important to state that *after their application the miotics become effective again,* not always, but very often. This is admitted also by Duke-Elder and Frank W. Law:—" It appears, however, that in conjunction with eserine a good effect can be produced in a case where eserine alone has remained ineffective."

Hence *my indication* for glaucoma simplex: First of all miotics; in case they suffice, nothing else. If, in spite of miotics, the tension remains high, only then glaucosan drops. As a rule I do not suggest operation unless and until all these conservative means fail.

Many novels end with the words: " and they entered the haven of matrimony." Many reports of clinical cases end with the word " operation." As though this would settle the matter, as though violent storms might not follow even after a short time! So Duke-Elder and Frank W. Law in their important and interesting work report among other cases: " Case 5. Male, aged 47 years; chronic primary glaucoma of right eye; six months' history. Tension full, pupil half dilated. Laevo-glaucosan four times in one hour. Marked reaction with some pain; tension down to normal; pupil widely dilated. Tension remained down three days, then rose slightly. Eserine; *tension fell. Trephine.*"

" Case 6. Male aged 53 years, chronic primary glaucoma of the left eye, three months' history. Had been on eserine, which had kept tension down until present subacute attack, when it was without effect. Laevo-glaucosan four times in one hour, marked reaction, pupil dilated, tension lowered to normal; began to rise in three to four hours; eserine instilled hourly. *Next day tension normal. Trephine.*"

The authors evidently have a wide experience and their work is very valuable, but since it is expressly stated: " Tension down to normal " I do not understand why they operated. Very likely it is often assumed that glaucosan drops help only temporarily. This has in fact to be tried from case to case. For with the same reason

* Manufacturer: Chemische Fabrik Woelm, Spangenberg b. Kassel, Germany.

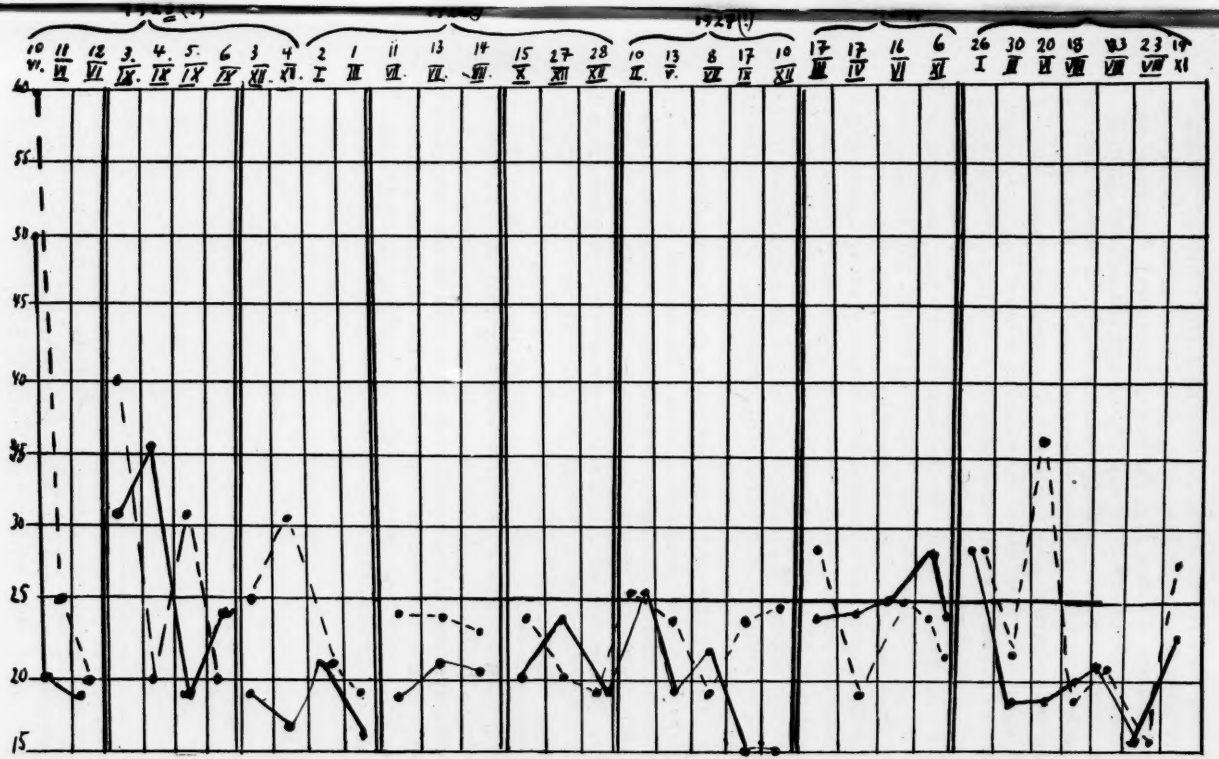
one might say: operation, too, helps only temporarily—every busy oculist knows eyes which, for glaucoma simplex, were operated on three, even four or more times (for examples see below).

A disadvantage of glaucosan treatment is the occasionally ensuing rise of tension. As a rule the latter goes down completely, later on the tension is usually so much the lower. The best way of treating this rise of tension is by eserine, 0·5 per cent., further by injection of 10 c.cm. 10 per cent. salt solution (NaCl) in the vein of the arm, and if need be, by subcutaneous injection of morphine. Also a bleeding might prove very effective.* Among the many cases of chronic glaucoma which I have seen, I only had to operate once because of an acute attack after glaucosan; in this case the operation did not bring the tension down to normal either, for the case was a particularly difficult one.—It is as a matter of course better to prevent these attacks according to the suggestion of the well-known American ophthalmologist Gifford of Omaha. Gifford expressly says that the occasional attacks following glaucosan drops (laevo-glaucosan) should not be deemed discouraging, for the value of this treatment is considerable and definite. He instils eserine twice with a lapse of 5 minutes; *then* glaucosan drops several times every 15 minutes; then again in the course of 2 hours eserine every 15 to 20 minutes.—I only treat *one* eye at each consultation, *never* both eyes on one day, particularly when I do not know the patient. One proceeds particularly cautiously, *e.g.*, if it is the only eye left, and if it is the first consultation, giving glaucosan drops only once in order to see how the patient reacts. I do the first instillation at the clinic or else I insist upon the patient remaining under supervision for several hours until the pupil has become narrowed again.†

As to the objection that glaucosan drops help only temporarily: this is right, their effect lasts only for days or weeks, but the effect produced by miotics is even limited to *hours*. The administration has only to be repeated. The following case illustrates that this can be done for years with the best success (see Curve) :

* The antagonist of glaucosan drops is histamine (aminoglaucosan); it is the most powerful miotic. Duke-Elder and Frank Law are quite right in saying (page 592 with regard to *acute* glaucoma): "Aminoglaucosan is an extremely potent miotic. It cannot be depended upon to contract the pupil and lower the tension in every case of acute glaucoma, but it would appear on occasion to be a very useful adjunct to eserine. *In cases where the pupil remains dilated and the tension raised after the administration of aminoglaucosan, this preliminary treatment has undoubtedly made eserine effective subsequently in bringing about a contraction of the pupil and a lowering of the tension.*" I believe the occurrence of a hypopyon without other obvious cause after the use of aminoglaucosan is not the consequence of this drug, but of the tonometer. I saw some accidents of this kind.

† As a rule the application is done by means of drop-ampoules; every ampoule contains the amount needed for one administration. For clinics the comparatively cheaper packing in 5 c.cm. bottles is preferable though these have to be kept cold and well closed and should be used up within a fortnight.



DESCRIPTION OF THE CURVE

Numbers (at left) mean mm. Hg; Tonometer Schiötz; 25 — *or 28* — in general is the limit of the norm. The dotted line represents the right eye, the straight line the left one.

Architect L.—Glaucoma simp. of both eyes, since June, 1925, under my treatment. History—see the text of the paper. Since the patient does not live in Berlin, Mrs. L. learned tonometry (in my clinic): she administers glaucosan drops as soon as the tension, in spite of miotics, is more than 25 mm. For 1925 the curve shows only occasional tests (lack of space), from 1926 on all the tests I have taken. Mrs. L. is measuring twice a week.

Look at the beginning and the end of the curve (4½ years). At the end mounting of the tension is a great exception. Vision and visual field are the same as in beginning of the treatment. He is drawing all his works himself.

Architect L. lives in a small place with no oculist in residence and has been under my treatment since June, 1925. Tension at that time 50 and 60 mm. Hg. (Schiötz Tonometer), *i.e.*, twice and three times as high as normal! *Scotomas extend almost to the centre.* Even the most willing operator might in such a case be very satisfied indeed to desist from an operation. Here the wife has not only done the instillation but learned also tonometry; I supervise from time to time. The patient is now 53 years of age, carries on his entire work; none of his chiefs knows that he has a disease. The glaucosan-eserine treatment is now being supplied for the fifth year. Similarly reports Dr. Haitz, Mainz (*Klin. Monatsbl. f. Augenheilk.*, 1929, Bd. LXXXII, S. 937): "A patient refuses operation. Under glaucosan his better eye keeps invariably well for two years and a quarter; whereas the other, operated on before, has been getting slowly worse (enlargement of scotomas)."

Of quite particular value are glaucosan drops in the case of secondary glaucoma (following iritis with synechiae), for they are the most powerful mydriatic known at the present; there is no other drug able at the same time to lower the tension and to dilate the pupil.* Duke-Elder and Law are quite right in writing: " In secondary glaucoma laevo-glaucosan will succeed in rupturing synechiae which with other mydriatics remain unaffected." Similarly Professor Stock (Ophthalmological Hospital, Tübingen): In the case of this form of glaucoma successes are not seldom simply brilliant: " pupil dilates, some synechiae rupture, glaucoma disappears." (*Klin. Monatsbl. f. Augenheilk.*, 1928, page 690.)

I do not aspire for a moment to render the glaucoma operations superfluous by means of glaucosan drops. Undoubtedly certain glaucoma eyes can only be preserved by operation, and sometimes operation is a real relief: but since the end is very hard to predict, the medical treatment—in my opinion—should be tried first of all if by any means possible.

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* See the paper: " Some clinical observations on laevo-glaucosan, etc.," by Ellet and Rythener, Memphis, U.S.A., *Amer. Jl. of Ophthal.*, 1929, p. 371: " We should like to call especial attention to the utility of glaucosan in this class of cases, namely iritis and iridocyclitis with increased tension. *It dilates the pupil more effectively than any other drug, and without any risk of further increasing the intra-ocular tension.*"

ANNOTATION

The Ophthalmological Society of the United Kingdom, Jubilee Meeting

This month sees the fiftieth anniversary of a society, the membership of which may justly be termed the hall-mark of a British ophthalmologist. We offer our hearty congratulations to the precocious stripling, which, born in 1880, very quickly reached years of discretion, and which after a lapse of fifty years is still the living force in British ophthalmology.

Our society grew out of informal meetings which took place in the house surgeon's room at Moorfields. In 1880, a meeting was held at Mr. Bowman's house to inaugurate the society. Of those present Sir Thomas Barlow is the sole survivor.

The time was ripe for the undertaking; the ophthalmoscope was aged exactly 29 years; the *Moorfields Reports*, our own special progenitor, had attained their majority just two years previously, while the *Ophthalmic Review* was then only germinating in the brain cells of Professor Priestley Smith and Dr. Grossmann. It was felt that there was room for a society, holding monthly meetings in term time, for the reading of papers, discussions and exhibition of cases, and so the society came into being with the respectable membership at the end of its first year of 140, 113 of whom were original members, of whom eleven are happily still with us to-day; and four honorary members: viz., Professors Donders, von Helmholtz, and Stokes, and Dr. Williams of Cincinnati.

Among those who have done most for the society we would mention Sir William Bowman and Mr. Nettleship, our first president and surgical secretary, respectively, and Mr. Adams Frost, who for 20 years was responsible for the care of the library. The Bowman Lecture, founded in 1883, and the Nettleship Prize Medal, founded in 1902, commemorate the former two. The Bowman Library, now housed in the Royal Society of Medicine, is a noble monument to Mr. Frost's untiring work.

At the present time the society has a membership of 531 ordinary and 5 honorary members. A set of the transactions is among the most treasured possessions of the British ophthalmic surgeon. That the society may continue to flourish is the fervent hope of us all. *Stet fortuna domus.* It is just possible that some of our most junior members may live to see and take part in a centenary celebration. We trust that they will be able to look back over a similar span of well spent years as the survivors of our original members.

ABSTRACTS

I.—LENS

(1) **Rötth, A. (Pécs).—On the significance of cataract remains. (Ueber die Bedeutung der Starreste.)** *Arch. f. Ophthal.*, Vol. CXXII, p. 34.

(1) It is recognised that in certain cases intra-ocular inflammation following cataract extraction is set up by lens substance, and the theories put forward to explain it are threefold, (*a*) mechanical, (*b*) chemical, and (*c*) anaphylactic.

Rötth made a series of experiments to test all three theories, and from his first series (re *c*) came to the conclusion that the inflammation is in all probability not anaphylactic in character.

As regards the mechanical or toxic action of lens substance his conclusions are that lens cortex in the anterior chamber of a rabbit's eye, like the protein bodies of the cortex (crystallins α and β), produces no appreciable mechanical or chemical irritation. A small particle of lens nucleus, however, sets up a fibrinous iritis, usually more violent than when it is introduced into the anterior chamber in suspension. This pronounced reaction is mechanical and probably also chemical in character, due to the albumoid or its derivatives.

The nucleus, especially when in suspension, leads to increased tension. It is possible that the nucleus sets up various forms of secondary glaucoma not only by blocking of the filtration angle but also through the products of its decomposition, *e.g.*, after dislocation of the lens into the vitreous or in spontaneous absorption of senile cataract.

The substances obtained from the digestion of lens matter by trypsin produce a toxic action on the iris, setting up a plastic iritis the intensity of which is directly proportional to the concentration of these substances.

Of the known products of digestion of protein, peptone usually causes a marked reaction in the iris. Of the amino-acids of the lens protein, introduced into the anterior chamber in quantity equivalent to one-half lens, arginin produces a moderate inflammation in the iris, and lysin in less degree, if care is taken that pH is constantly 7·3. As to the insoluble substances, the introduction of tyrosin and cystin in minimal quantity is followed by a marked reaction.

As to the origin of intra-ocular inflammation in man after cataract extraction cortical remains are seldom the cause. It is suggested, however, that the products of decomposition stored up in the hypermature cataract have a toxic action on the iris, when the capsule is

opened, owing to their great concentration; in other cases these toxic substances diffuse through the capsule and set up iritis, because owing to the slow exchange of the aqueous their concentration increases—a view that is supported by clinical observations.

It is probable that the products of chemical change in the lens may cause chorio-retinitis.

The author finally points out that cataract remains form an excellent medium for the growth of conjunctival bacteria, a fact of much greater importance than their chemical action; a comparison of the results of cataract extractions in and out of the capsule, as performed in the Pécs clinic, affords ample proof that extraction in the capsule is an important prophylactic against post-operative inflammation.

THOS. SNOWBALL.

II.—RETINA

(1) **Junius, P. (Bonn).—Some remarks concerning the conditions known as Coats's disease, retinal degeneration with multiple aneurysms (Leber) and the so-called angiomatosis of the retina (von Hippel's disease). (Bemerkungen zum Krankheitsbild der "Retinitis (Coats)," der "Netzhautdegeneration mit multiplen Aneurysmen (Th. Leber)" und der sog. "Angiomatosis retinae (Czermak-von Hippel.")** *Zeitschr. f. Augenheilk.*, Vol. LXVIII, p. 208, 1929.

(1) In an article which well deserves perusal in the original, **Junius** gives a critical survey of the present state of knowledge concerning that ill-defined group of vascular lesions with which the names of Coats and of von Hippel are particularly associated. The recent work of Lindau is recalled, which clearly established the close connection between angiomatosis of the retina with similar lesions in other parts of the central nervous system, well illustrated by a case described by Cushing and Bailey. This case, a patient aged 30 years, first came under observation with a diagnosis of cerebellar tumour; operation showed it to be a vascular mass. Apart from an " enormously tortuous and dilated vein " there was seen nothing of import in the fundi. This was in 1922. Six years later the right eye showed extensive changes in the calibre and character of the arteries and a definite angioma of the retina of the left eye. This is the type of association brought out by Lindau, who also showed that these cases may have cysts of the pancreas and hypernephromata (" Lindau's syndrome "). Lindau regards the vascular lesions as haemangioblastomata arising out of congenital rests, which are often multiple in nature and as far as the

eyes are concerned tend to develop in the third decade of life. The vascular lesion he regards as the primary and the glial new formation as secondary. Lindau draws a clear distinction between angiomatosis of the retina (v. Hippel) which he places in the above described class of haemangioblastomata, and Coats's disease which he considers of a different aetiology altogether.

That angiomata in general are not necessarily isolated lesions is supported by a series of observations drawn from other writers. The work of Brushfield and Wyatt is referred to, in showing the association of cutaneous naevi with hemiplegia and mental defect in children. The association of naevi with vascular tumours of the brain has further been shown by Cushing and Bailey, and a recent case of Parkes Weber is of interest in that it not only showed an associated cutaneous and cerebral haemangioma, but the further association of buphthalmos on the side of cerebral naevus. Reference is also made to the case recently reported by Foster Moore in which an haemangioma of the visual cortex was associated with a coloboma of the optic disc and naevus of the face.

These observations, whilst they do not solve the pathology of von Hippel's disease, tend to bring this angiomatosis of the retina in line with other naevi, and the multitude of names under which this condition has been described by different observers represent but the different clinical stages in which it has been described. Junius leaves it an open question whether Lindau's conception of angiomatosis as the result of activated congenital cell rests is the correct explanation. More data on the earlier stages of von Hippel's disease are required.

Coats's disease represents great difficulties in the multitude of appearances it may show. Even Coats held that essential links were still missing to correlate the various appearances into a distinct clinical entity. As for the aetiology this is quite unknown: one cannot even say whether the lesion is of a purely local or of general origin.

As for the condition described by Leber as retinal degeneration with multiple aneurysms, there are no substantial reasons for regarding this as a separate clinical entity.

Junius points out that the conditions described by Coats, von Hippel and Leber have this in common: that it is especially the small vessels that tend to be affected, and that in all these conditions aneurysms, tortuosity and irregular constriction of the arteries are to be found. In favour of regarding von Hippel's disease as distinct from Coats's there is the evidence of Lindau's work, and the fact that there appears to be a familial tendency in this affection. But, on the other hand, it is of interest to note that it shares with Coats's disease the characteristic of chiefly affecting males between the ages of 3 and 30.

Junius suggests that some disturbance in the nerve supply of

vessels may be the underlying cause of all these conditions with their associated lesions—just as the association of buphthalmos with neurofibromatosis finds a parallel explanation.

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Foster Moore, R.—Haemangioma of the meninges involving the visual cortex. *Brit. Jl. of Ophthal.*, Vol. XIII, p. 252.

ARNOLD SORSBY.

(2) **Pressburger, E (Vienna).—Cystic degeneration of the peripheral retina. (Ueber die zystoide Entartung der Netzhautperipherie.)** *Zeitschr. f. Augenheilk.*, Vol. LXVIII, p. 331, 1929.

(2) The pathology of cystic degeneration of the retina is unknown, though the condition is so very common in old people as almost to be regarded as a normal senile change. **Pressburger** reviews the literature on the subject and records the results of his own examination of thirty eyes of different ages. His conclusions agree in the main with those of earlier observers.

To the clinician the condition is of little importance as it does not affect vision and owing to the fact that as it involves the region of the ora serrata it is beyond the reach of the ophthalmoscope. The affection spreads but rarely beyond the equator, and the temporal side is more frequently affected than the nasal side. The site of election for the pathological changes would appear to be the inner nuclear layer. The author agrees with a recent writer (Ochi, *Amer. Jl. of Ophthal.*, March, 1927) that the condition is by no means a senile manifestation, and though it is decidedly more frequent with advancing years, it does appear in young people and even in children. Pressburger finds no support for the suggestion that the condition is secondary to choroiditis, nor for the converse

that it excites inflammatory lesions in the choroid. The localisation of the affection to the neighbourhood of the ora serrata is difficult to explain. Oedema, falling more heavily on the periphery; the nearness of the ora serrata to the ciliary body (with its secretion) and the greater intimacy of the periphery of the retina with the vitreous have all been suggested. The author draws attention to the fact that the space formation in cystic degeneration of the retina is very reminiscent of the spaces normally present in the ciliary body, and that these two sets of spaces merge imperceptibly one with the other. Because the fluid in the spaces in the degenerate area stain a good red colour with eosin, it is held that the fluid is richer in albumen than aqueous, and is probably a transudate. Pressburger has failed to find any evidence of cystic degeneration in embryonic eyes.

ARNOLD SORSBY.

(3) **Holloway, T. B. (Philadelphia) and F. H. Verhoeff (Boston).—Disc-like degeneration of the macula.** *Arch. f. Ophthal.*, February, 1929.

(3) **Holloway** and **Verhoeff** describe cases of macular disease in old people. The salient points are as follows:—

Case 1 was a man aged 77 years with some general arteriosclerosis and a greyish yellow discoid area in the macular region of each eye. The retinal vessels were very sclerosed but there were no fresh haemorrhages.

Case 2 was a man aged 68 years who had retinitis circinata in the left eye with yellowish-white dots scattered about inside the circle of exudate. During the next few months the circinate patch became more yellow and " a vague exudate " developed inside it, while during the next two years fresh haemorrhages kept forming within and about the circinate lesion, exudates disappearing and reforming.

Case 3. A woman aged 75 years had a circinate patch in the right eye, the upper portion of which had almost disappeared in 18 months, while the lower portion became less evident.

Case 4 was somewhat similar.

Case 5, a man aged 79 years, in addition to retinitis circinata, had a greenish yellow mound of exudate over the macular region which, during the next two months, became more circumscribed and spherical while there was partial absorption of the circinate exudates.

Case 6 was one in which retinitis circinata was seen to develop over the site of a circinate mass of haemorrhage.

Case 7 was one in which the eye was obtained for histological investigation an hour and a half after death; a yellowish-white

mass having been observed in the macular region during life. This mass was found to consist chiefly of hyaline connective tissue, situated between the retina and choroid. Its outer half was supplied with blood vessels which had come from the choroid through small defects in Bruch's membrane, but the inner half was almost avascular. The neuro-epithelium of the portion of retina which lay over the mass was completely destroyed. Holloway and Verhoeff suggest that the mass was formed by proliferation of cells of the pigment epithelium, because, at the periphery, all transition stages from normal pigment cells to pigmented spindle cells, and finally into unpigmented cells indistinguishable from connective tissue cells, could be made out. This metaplasia of the pigment epithelium was probably due to impaired nutrition consequent on choroidal vascular sclerosis.

F. A. W.-N.

BOOK NOTICE

Benevenutus Grassus of Jerusalem. ***De Oculis Eorumque Egritudinibus et Curis.*** Translated, with notes and illustrations, from the First Printed Edition, Ferrara, 1474 A.D., by CASEY A. WOOD, M.D., LL.D. California: Stanford University Press, and London: Humphrey Milford, Oxford University Press. Pp. 13 and 101. 1929. Price, 23s.

We extend a cordial welcome to this work which reflects the greatest credit on Dr. Casey Wood and, indeed, on all concerned in its production.

Ophthalmic surgeons should be proud of the fact that among the incunabula, *i.e.*, books printed before 1500 A.D., and thus in the swaddling-clothes stage of printing, two, the Ferrara Grassus and Anton Sorg's finely printed edition of the *De Oculo Morali* of Archbishop John de Peckham, should find a place. The latter work is not the work of a practical ophthalmologist, and in it, as Dr. Casey Wood says, "the eye serves as a peg on which to hang saintly saws and religious dogmas." Grassus, on the other hand, was for more than 500 years the most popular text-book on ophthalmology, holding its own throughout the Middle Ages. It is an intensely practical work and well repays study even to-day. Some of the descriptions of disease, notably those of trachoma and pterygium, would pass muster even now. Grassus recognised seven types of cataract, four of which were curable and three incurable; he issues a warning against operating on unsuitable cases which may be

remembered with advantage for all time. His surgical treatment of cataract was, of course, couching; he solemnly admonishes his hearers, after the cataract has been depressed from the region of the pupil, to hold it down till they have said four *pater nosters*.

He recognised the connection between *muscae volitantes* and black bile. He is always careful to pay due attention to the general health; he is altruistic enough to remind his hearers that they should treat the poor gratuitously; if, however, the patient be wealthy and costly drugs, such as powdered pearls, be indicated in the treatment, they should be used. His topical applications sound for the most part bland and unirritating; and his armamentarium is singularly free from the nasty messes that formed so great a part of mediaeval therapeutics.

Not the least interesting part of the book is the translator's scholarly preface, while much botanical and pharmaceutical lore is to be found in the footnotes which explain the composition of the ingredients in use.

The actual year of publication of this Ferrara text may not be a matter of certainty, but Dr. Casey Wood supplies cogent arguments for placing it in 1474, the year before the *De Oculo Morali* was published. The late Professor Hirschberg was of the opinion that Grassus was a renegade Jew. Dr. Casey Wood questions this supposition; he thinks that this book "does not necessarily picture an apostate Jew adding enough Christian savor to leaven the heretical text . . . but rather the act of a prudent printer-publisher who . . . brought the work 'up-to-date' by introducing, here and there, a few churchly maxims."

There are 22 manuscripts and about 18 printed editions of this work extant, the earliest manuscript being the thirteenth century Provençal codex now in the library of the University of Basel. Dr. Casey Wood's researches have located eight copies of this Ferrara edition; three in America; one in the library of the Royal College of Surgeons of England, and the rest on the continent, one each at Rome and Naples and two in the Bibliothèque Nationale de Paris.

The facsimile illustrations of three pages of the Ferrara text, with pages of the Provençal and Bodleian codices add greatly to the interest and value of the book. The printers deserve great commendation for the really beautiful type, paper and format of this book which fills a notable gap in ophthalmic literature. British and American ophthalmology owes much to Dr. Casey Wood; we hope that he will be able to see his way to giving us a translation of Peckham's work, which would place copies of the ophthalmic incunabula within the reach of us all.

CORRESPONDENCE

KERATITIS SICCA

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

SIR,—With reference to my article on this subject in your February issue, Professor H. J. M. Weve, of Utrecht, has written calling my attention to the report of a case of his in the *Nederlandsch Tydschrift voor Geneeskunde*, 1928, I, No. 7. As it may be of interest I am appending the following notes from his letter:

"The patient, a female aged 33 years, complained of epiphora in the left eye and as the function of the lacrimal ducts proved normal the gland was partially extirpated (1920). Thereafter lacrimal secretion stopped immediately and entirely in this eye with the result that a chronic keratitis of the filamentary type developed with marked irritation and the production of fibrinous threads in the conjunctival sac much like those observed after the local application of silver nitrate. Protection with a watch glass alleviated the discomfort, but it ultimately had to be abandoned. The lacrymal puncta were then cauterized, a procedure which was followed by some improvement. After the application of several expedients, fibrolysin was given by instillation into the conjunctival sac once a day, whereupon all symptoms vanished within a week. This treatment has been continued for eight years, during which time the patient has comfort as long as the fibrolysin is used, but the symptoms return as soon as the remedy is stopped."

This case confirms the suggestion which I had made that even the partial extirpation of the lacrymal gland was a procedure which was not entirely without danger; and it is interesting as it is the only reference, so far as I am aware, to any therapeutic measure having a beneficial effect apart from the mechanical influence of drops of an oily nature.

Yours truly,

W. S. DUKE-ELDER.

LONDON.
February 17, 1930.

BLINDNESS IN INDIA

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

SIR,—The communication on "Blindness in India" which appears in your January issue may possibly misrepresent the existing state of affairs with regard to the prevention of blindness in this country. To some of your readers it may appear that the All-India Blind Relief Association is the only organisation which deals with this important problem, whereas the work done in this connection by other agencies must be very much greater. The editorial in the *Indian Medical Gazette* for September, 1929, on

" Preventable blindness in India " gives a general idea of the position. Apparently at the time it was written the All-India Blind Relief Association was not in existence. . The exact relationship of the All-India Blind Relief Association to the older Blind Relief Association established in 1919 is not clear. In the past the Blind Relief Association has done very excellent work, but I think it is a pity that some of the communications intended to help that organisation which have appeared should not recognise the immense amount of work which is being done in this connection by other agencies, particularly by Government.

Yours truly,

ROBERT E. WRIGHT.

MADRAS.

NOTES

Moorfields Research Scholarship

THE Moorfields Research Scholarship for the current year has been awarded to Mr. J. H. Doggart.

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St. Margaret's Hospital for Ophthalmia Neonatorum

THE annual returns for St. Margaret's Hospital for ophthalmia neonatorum for the years 1928 and 1929 are as follows:—

No. of children admitted		No. of mothers admitted		No. of children discharged with both eyes blind		No. of children discharged with single eye blind		No. of eyes with impaired vision	
1928	1929	1928	1929	1928	1929	1928	1929	1928	1929
204	224	138	135	Nil	1	3	1	23 (6 both eyes, 11 single eye)	17 (6 both eyes, 5 single eye)

DEATHS—BABIES 10.

Syphilis	3
Prematurity	4
Fracture base of skull	1
Diphtheria...	1
Gastritis	1
	10

During the course of the year 322 midwives and post-graduates visited the Institution. They were largely drawn from Queen Charlotte's Hospital, the College of Nursing, Middlesex Hospital,

and Post-graduate School of Midwifery and Post-graduates studying for Diplomas of Public Health. Not one medical student visited the Institution during the year.

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White Oak Schools, Swanley, Kent

REPORT by Mr. M. S. Mayou, visiting ophthalmic surgeon, on the treatment of eye diseases at White Oak, Swanley, Kent.

This Institution has demonstrated beyond all doubt that the isolation combined with institutional treatment of the various forms of ophthalmia has been one of the most successful efforts in preventative medicine, in that it has practically eradicated trachoma from the Central London District Schools and from the schools under the administration of the London County Council. The other forms of chronic conjunctivitis and blepharitis are being similarly eradicated. There are still a number of beds unoccupied in the Institution, and although the Board have extended the use of the Institution to schools outside the Metropolitan area, these schools for the most part are not inspected by a surgeon skilled in the recognition and treatment of ophthalmia. It is probable that if this were done, the beds at present vacant at Swanley would be utilised for the purpose for which they were intended and for the benefit of the community.

The admissions for the year 1929, and the diseases from which they suffered were as follows:—

Trachoma	31
Chronic conjunctivitis	37
Marginal blepharitis	43
Phlyctenular ophthalmia	101
Follicular conjunctivitis	6
Ulcer of cornea	3
Mucopurulent conjunctivitis...	3
Interstitial keratitis	42
	266

The following were discharged as cured:—

Trachoma	20
Chronic conjunctivitis	19
Marginal blepharitis	41
Phlyctenular ophthalmia	99
Follicular conjunctivitis	6
Ulcer of cornea	15
Mucopurulent conjunctivitis...	3
Interstitial keratitis	35
	238

SUMMARY

Remaining January 1, 1929	246
Admitted during year	266
Discharged cured	238
Removed by order of parents or guardians ...	22
Absconded	1
Deaths	1
Remaining December 31, 1929	250

The sunlight treatment which has now been in operation for over two years, especially for the treatment of phlyctenular conjunctivitis, ulceration of the cornea and interstitial keratitis has caused a marked improvement in the general condition of the patients and a definitely beneficial effect on the disease. In 1929, 434 cases received treatment. Artificial sunlight is used in winter and open air sunlight in summer time.

The local treatment of marginal blepharitis by staphylococcus vaccine, which was originally instituted at White Oak has been continued and constitutes a great advance in the treatment of the disease. Old standing cases, which have been in White Oak for years, have cleared up under this treatment which has been extensively used; also the eczema with which it is so frequently associated has been cured by the use of the local treatment with vaccine. In 1929, 140 cases were treated. No untoward results have been observed.

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Royal London Ophthalmic Hospital Dinner

THE Annual Dinner of Past and Present Students of the Royal London Ophthalmic (Moorfields) Hospital took place at the Langham Hotel, on Thursday, February 13, 1930.

Seventy-two, including the guests, were present and among them were Mr. J. Herbert Fisher, who was the Chairman; Lord Moynihan; Sir J. Rose Bradford; Sir Walter Fletcher; Sir William Lister; Sir John Parsons; Mr. Luling, the Chairman of the Hospital; Mr. Lawford, Mr. Traquair, Mr. Williamson-Noble (Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY), Professor Elliot-Smith, and Dr. A. M. H. Gray (Dean of the University College Hospital Medical School). The various toasts were proposed by the Chairman, Lord Moynihan, Mr. Affleck Greeves and Mr. Foster Moore.

The Dean (Mr. Charles Goulden) presented his report for the year 1928-1929 in which he made the following remarks:—

Up to the year 1927, the record entry of new students had been 121 who had been admitted in 1925. In 1927 the record was much increased and 134 new students joined the School. These numbers

coincided with an increase in the entry for the D.O.M.S. Examination and so were an index of an increased interest in the study of post-graduate ophthalmology. The year 1928-29 marked a return to our normal numbers and 114 students were admitted, although we had no less than 204 students attending the practice of the Hospital.

Between October, 1928, and October, 1929, 428 lectures were given by members of the staff assisted by Mr. Hume and Mr. Brinkworth. Professor Elliot-Smith gave a series of lectures on " The Optic Connections in the Brain " and Mr. Traquair on " Perimetry," which were well attended not only by members of the School but also by others interested in these subjects.

Among the Examination results the successful candidate for the M.S. degree of the London University in Ophthalmology was an old student. He is the first to gain this distinction. At the D.O.M.S. Examination of the Conjoint Board, in which many of our students are interested, we have had very satisfactory results. In the First Part, of the 107 candidates we presented 42, and of the 60 who were successful 33 had attended the Course at the Hospital. In the Second Part, of 76 candidates 55 came from Moorfields and of the 51 successful candidates 39 were our students.

During the past year the School has lost by retirement the services of Sir William Lister. Apart from the help he gave in the way of clinical teaching, he was a generous benefactor. Mr. Davenport has been elected a member of the staff.

The whole Out-patients' Department is about to be enlarged and reorganised. The Lay Board have already purchased additional buildings for this purpose and when alterations are made there will be much better teaching arrangements and we, as a school, will gain the space we badly need for laboratories, library, study rooms and so on. The hospital is about to enter upon a new era with the improved Out-patients' Department. It is here that the School has earned its reputation, it is here that our students pursue their work among clinical material that is probably unrivalled in the world, and it is in practical clinical work and teaching that the genius of British Medicine lies.

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Eclipse Blindness

IT may be of interest to point out that it was apparently known by the ancients that the sight would receive damage if anyone looked at an eclipse of the sun. Here is what Plato makes Socrates say in the *Phaedo* (Jowett's translation, 1871): " I thought that as I had failed in the contemplation of true existence, I ought to be careful that I did not lose the eye of my soul; as people may injure their bodily eye by observing and gazing on the sun during an eclipse,

unless they take the precaution of only looking at the image reflected in the water, or in some similar medium."

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An Ophthalmological Item from the Bible

A novel, "The Coat of Many Colours," by Mr. Bechofer Roberts (John Lane) reviewed in *The Times* Literary Supplement of February 6, 1930, raises an interesting point in biblical ophthalmology. Everyone remembers that in the authorised version, Leah (Genesis 29, 17) is alluded to as tender eyed, while Rachael was beautiful and well favoured. Mr. Roberts renders tender eyed as sore eyed. We were interested and turned up the reference in the Septuagint. This runs as follows :—

Οἱ δὲ ὀφθαλμοὶ Λείας ἀσθενεῖς,

which certainly seems to bear out Mr. Roberts's suggestion. Later in the same chapter Leah refers to her affliction. *ταπεὶνωσιν*, in the Greek, which means lowness of spirits, for which she had other causes than sore eyes.

FUTURE ARRANGEMENTS

1930

April 1.—Midland Ophthalmological Society, at Wolverhampton.

April 2-5.—Ophthalmological Society of the United Kingdom, Annual Congress. Thursday, April 3.—*Morning.*—Presidential Address. Presentation of Nettleship Medal. *Afternoon.*—Papers. Discussion. *Evening.*—Reception at Royal College of Surgeons, 9—12.
Friday, April 4.—*Morning.*—Papers. *Afternoon.*—Papers. 5 p.m.—Bowman Lecture. Sir Arthur Keith. Subject: "The Genius of Sir William Bowman." *Evening.*—7.30 for 8, Banquet at Fishmongers' Hall, London Bridge.
Saturday, April 5.—*Morning.*—Papers. Business Meeting. *Afternoon.*—Visit to Zoological Gardens, tea in the Fellows' Tea Rooms at 4.15.

June 3.—Midland Ophthalmological Society, at Worcester.

June 13.—Section of Ophthalmology, Royal Society of Medicine. (Annual Meeting.)

July 10-12.—Oxford Ophthalmological Congress, at Oxford.

August 26-29.—British Medical Association, at Winnipeg.

October 7.—Midland Ophthalmological Society, at Birmingham.

December 2.—Midland Ophthalmological Society, at Birmingham.

CONTEMPORARY OPHTHALMIC LITERATURE

American Journal of Ophthalmology. *February, 1930.*

STINE. Variations in refraction of the visual and extravisual pupillary zones.
FUCHS, E. Subjective symptomatology of ocular disorders.
FERREE and RAND. Methods for increasing the diagnostic sensitivity of perimetry and scotometry with the form field stimulus.
CALLENDER and THIGPEN. Two neurofibromas in one eye.
YOUNG. Recurrent haemorrhages into retina and vitreous; calcium deficiency as possible cause.
BLATT. The tolerance of the crystalline lens to metallic foreign bodies.
BLACK and HAESSLER. Post-traumatic ocular tuberculosis.
KNAPP. A case of corectopia.

Annales d'Oculistique. *December, 1929.*

BERENS. Studies in immunity in its connection with ophthalmology; vaccines and non-specific therapy.
TERSON. Late results of the intrapalpebral injection of alcohol in spontaneous entropion of the lower lid.
TERSON. Orbital cellulitis and its resolution.
D'ANDRADE. Orbital sarcoma with abnormal development.

January, 1930.

SCHIFF-WERTHEIMER and TILLÉ. Progressive bilateral macular disease in young subjects. (Stargardt's disease).
PATRY. Relapsing optic neuritis during pregnancy.
SCARLETT. Floating cyst in the vitreous.
DIMISSIANOS. Experimental researches on the pathogenesis of papilloedema of orbital origin.

Archives d'Ophtalmologie. *January, 1930.*

DUVERGER and VELTER. The surgical treatment of chronic glaucoma.
WEEKERS. The importance of locality in ocular disease.
GALAVIELLE and DEJEAN Ocular myiasis with oestrus ovis.
CHAMS. Keratitis in Leishmaniasis.
CUÉNOD and NATAF. Ultra-virus and trachoma.

Archiv für Ophthalmologie. *January, 1930.*

RIEHM. On the significance of anaphylaxis in the clinical course of sympathetic ophthalmitis, of tuberculosis and of organic infections.
GAUSS. On the course of the blood vessels in the retina.
KREIKER. On the light reflexes of the normal surface of the retina.
IGERSHEIMER. Anatomical findings in a case of keratitis pustuliformis profunda.
FISCHER. Measurements of the compensatory rotation of the eyes, and the localisation of the apparent vertical with lateral bending of the trunk up to 360°. Part ii. Investigations on normal people. Part iii. Investigations on a deaf person with functional incapacity of both labyrinths and on a patient with loss of one labyrinth.
OHM. On nystagmus.

Archivio di Ottalmologia. *November, 1929.*

FARINA. Endocular hypertonia and true glaucoma. Study of pathogenesis and therapeutics based on neuro-endocrinology.
NICOLATO. On the genesis of myopia. Preliminary note.

Bolletino d'Oculistica. *November, 1929.*

CAVARA. Contribution to our knowledge of Krükenberg's spindle.
ROSSI. On the behaviour of ocular tuberculosis in animals with a previous mycotic infection.
ALIQUÒ-MAZZEI. Contribution to our knowledge of the ocular syndrome in aneurysm of the internal carotid.
LAMPIS. Bilateral partial external ophthalmoplegia associated with miosis.

Revista Oto-Neuro-Oftalmologica. *November-December, 1929.*

FUMAROLA. Memorial to Giovanni Mingazzini.
AGNELLO. Orbito-cavernous thrombophlebitis from purulent ethmoido-maxillary sinusitis.
DE ANGELIS. Clinical and anatomico-pathological contribution to the diagnosis of cysts of the posterior horn of the lateral ventricle.
PALLESTRINI. On some residual labyrinthine disturbances from spinal anaesthesia.
DI MARZIO. Orbital complications of sinusitis.

Archivos de Oftalmologia de Buenos Aires. *November, 1929.*

BARBIERI. Idiopathic familial hemeralopia and night blindness in degeneration of the chorio-capillaris.
ADROGUÉ and BALADO. On the therapeutic pathogenesis of oculo-gyral crises.
SATANOWSKY. Glioma or endocular tuberculosis?
DUSSELDORP. Adenocarcinoma of a gland of Moll.
MANES. Papilloedema.

Archivos de Oftalmología Hispano-Americanos. *February, 1930.*

VALERO. Symptomatology of ocular paralyses.

Revista Cubana de Oftalmologia y Oto-Rino-Laringologia. *January, 1930.*

DAVIDSON. Medico-legal problems of ophthalmology.
MÁRQUEZ, J. G. The characters of the retinal pulse in intra-cranial disease.
LOECHES and DIHIGO Crouzon's disease.
FERNÁNDEZ. Trachoma in Venezuela.
MENDOZA. My opinion of tonometry before cataract extraction.
GUIRAL. Spielmeyer and Vogt's disease.

Revista Oto-Neuro-Oftalmologica y de Cirugia Neurologica. *October, 1929.*

The Thirteenth International Congress of Ophthalmology.
PAVIA. The importance of modifications of reflexes from the internal limiting membrane as a sign of general pathological conditions.
——— Radio transmission of photographs of the fundus. Echo of the experiment of Dr. Pavia.